NATIONAL MUSEUM OF VICTORIA

R. Prescott.

Vol. XXIII. **Part 11.**

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The Journal of the Department of Agriculture of Victoria, Australia.

November, 1925.

PRINCIPAL CONTENTS

Better Farming Train

The Feeding of Live Stock

Plum and Prune Culture

Government Herd Test Rules

Classing Farmers' Wool

Experiments in Cool Storage of Fruit

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THE JOURNAL

OF

THE DEPARTMENT OF AGRICULTURE.

VICTORIA, AUSTRALIA.

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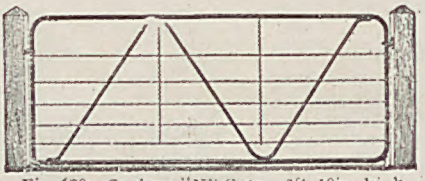

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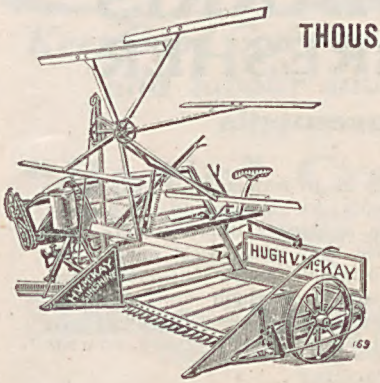

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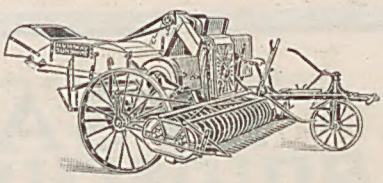

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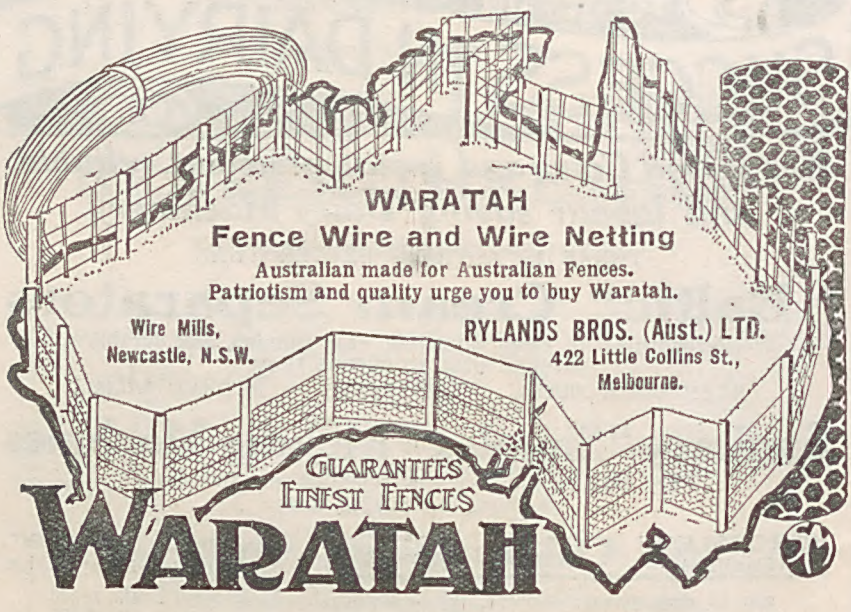

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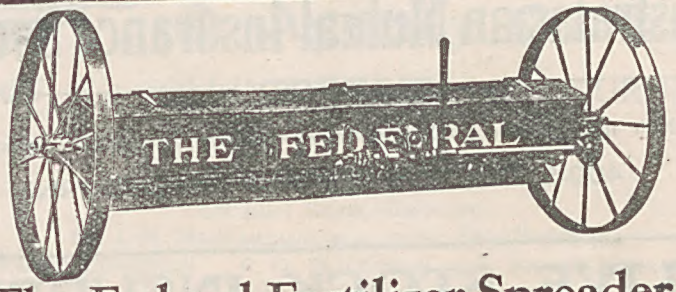

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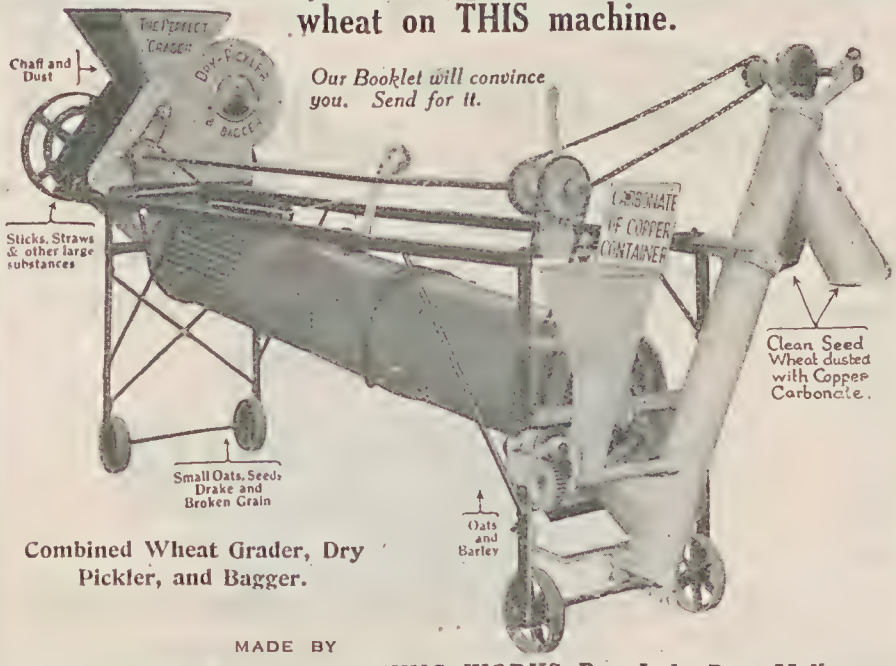
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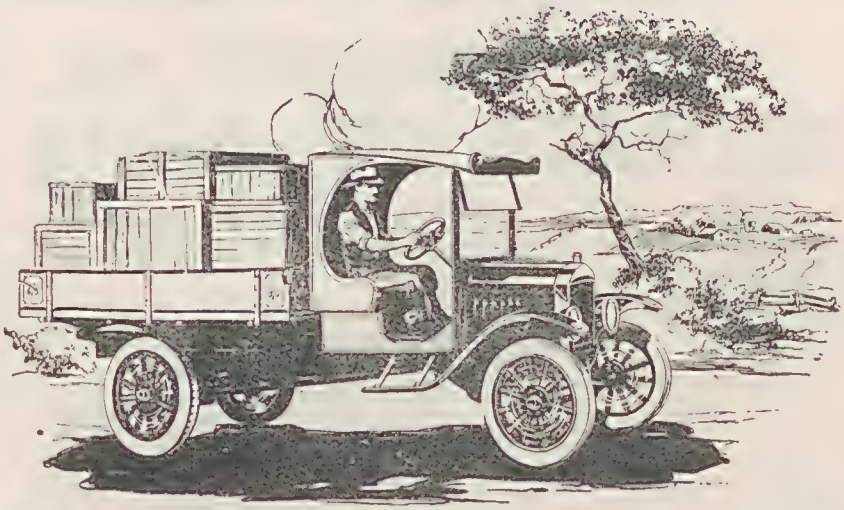

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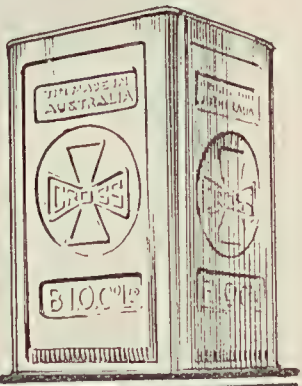

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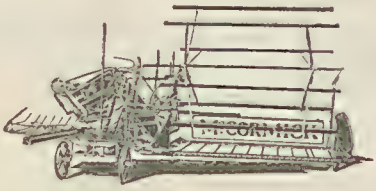

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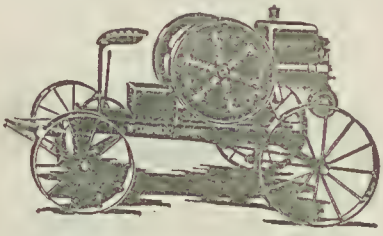

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Vol. XXIII. November, 1925. Part 11.

BETTER FARMING TRAIN.

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"During the last twenty years," Dr. Cameron says, "I have been intimately associated with the efforts made by this Department to effect advancement in agricultural methods, and I also have an intimate knowledge of the efforts made by Government Departments and other organizations right throughout Australia for that period.

"Such efforts include vigorous lecturing campaigns undertaken from time to time; experiments and demonstration plots on private farms; the carrying on of farmers' classes in local centres and under the auspices of district progress associations and societies, the establishment of farm bureaux in country districts, particularly in South Australia and New South Wales, and also at the Agricultural Colleges; the organization of extension work for farmers and farmers' sons at agricultural colleges and vacation classes and at the Universities.

"I have no hesitation whatever in saying that the Better Farming Train has made a greater appeal to the practical farmer and the younger generation of agriculturists than anything that has hitherto been attained in Australia.

"In common with every one who has seen the train, I have been struck with wonderment at the interest that has been shown, and the keenness displayed by visitors to the train for the acquirement of knowledge which the exhibits on the train and the demonstrations afford.

Time Was Just Ripe.

"So far as Victoria is concerned, I consider that the time for the initiation of this educational medium was just ripe. I doubt whether anything like the success that has been achieved could have come about at any prior period.

"The success of the train has been largely promoted by the fact that in the exhibits displayed we have been able to put forward the results of research experiments and the practical trying out on broad acres of new methods which have come into practical use during recent years and also the large amount of research work which has

been carried out in the experimental farms and colleges throughout the State and Australia during the last decade.

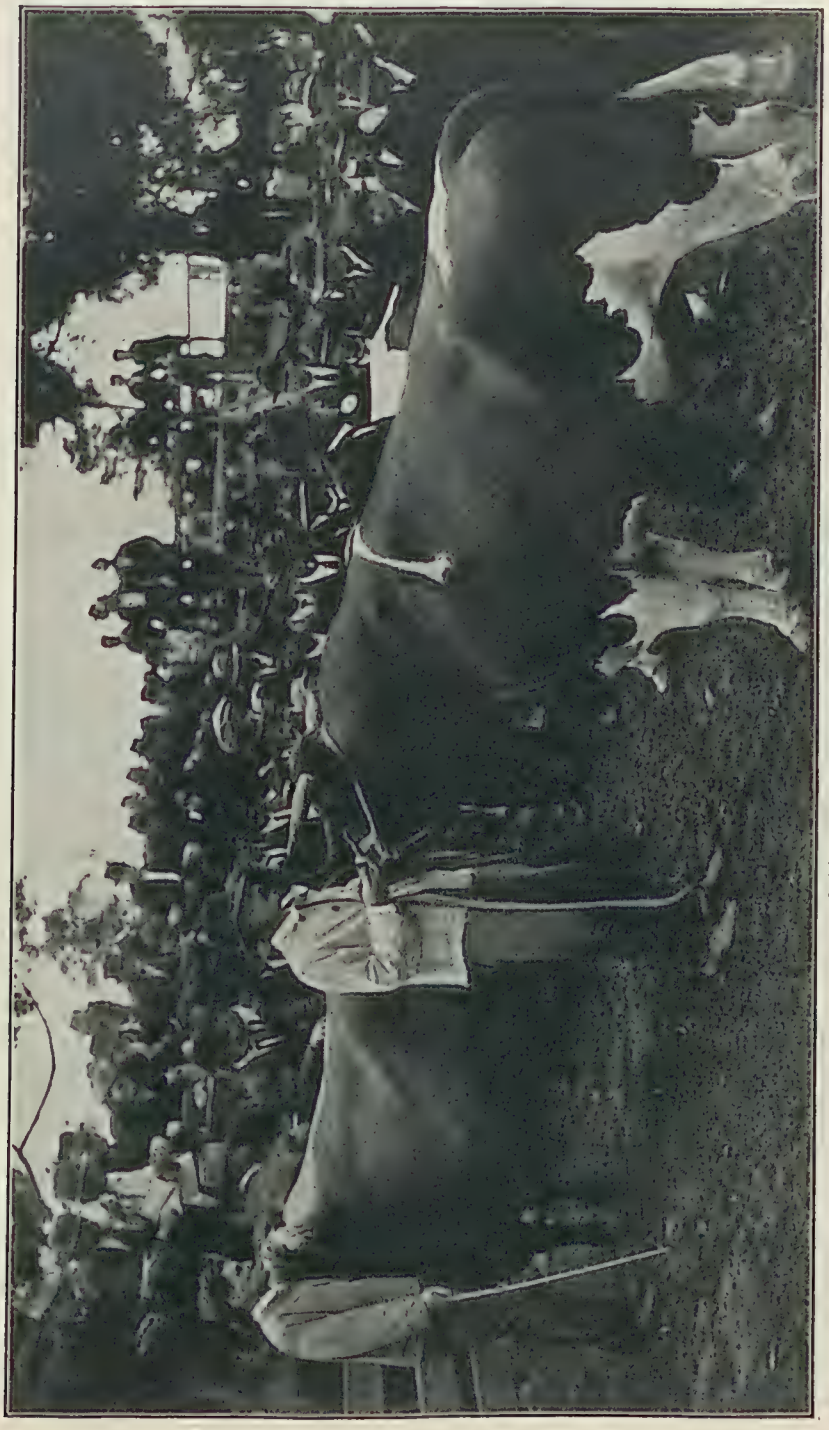
"Ten or twelve years ago we would not have had this material with which to drive home in a practical fashion the lesson desired to be taught.

The Agricultural College on Wheels.

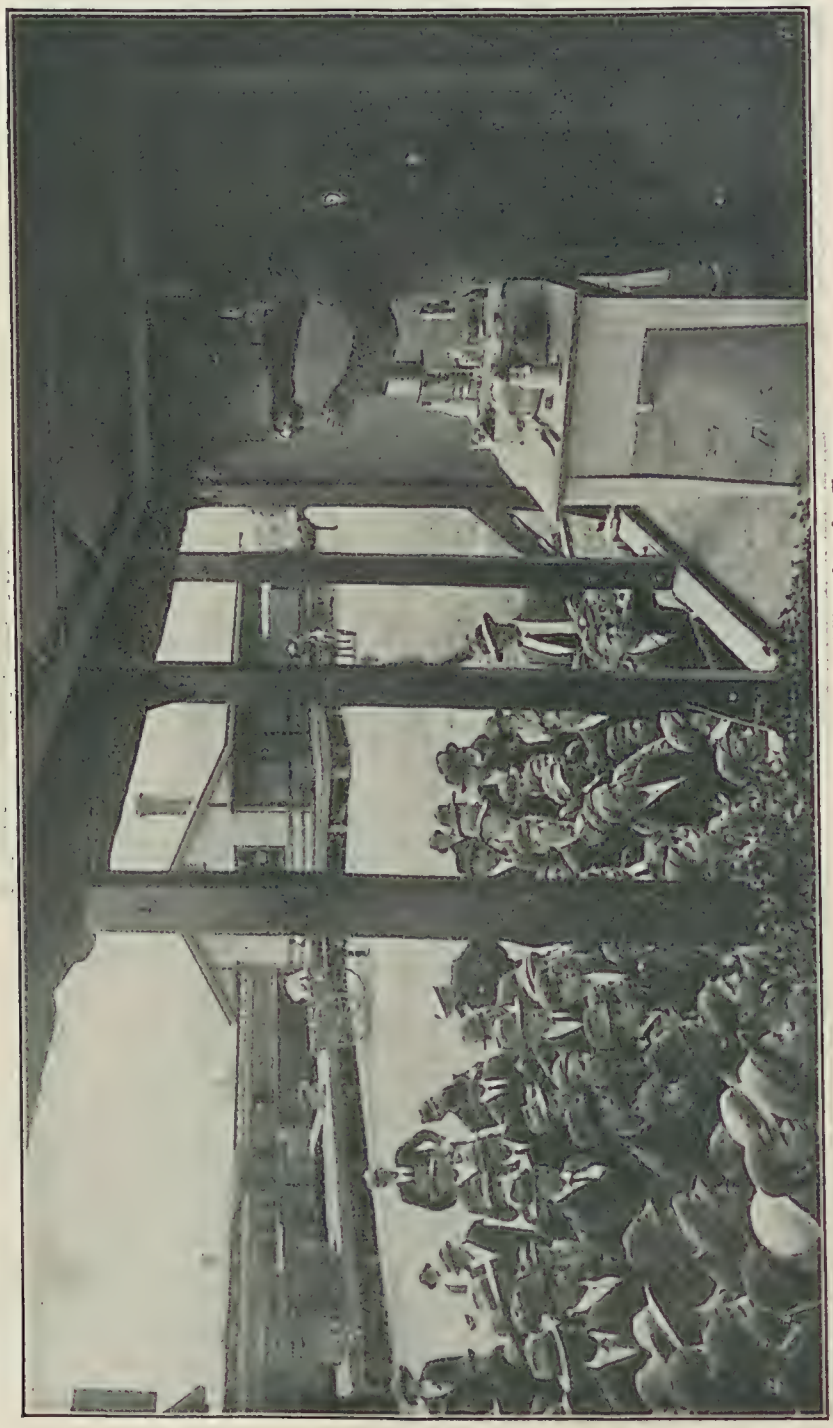
A Typical Attendance.

"Whilst it will of necessity be some time before the knowledge that the ordinary run of farmers have obtained from the Better Farming Train, so far as improved agricultural practice is concerned, will have its effect upon the agricultural output, in the matter of the improvement of live stock already definite indications are available.

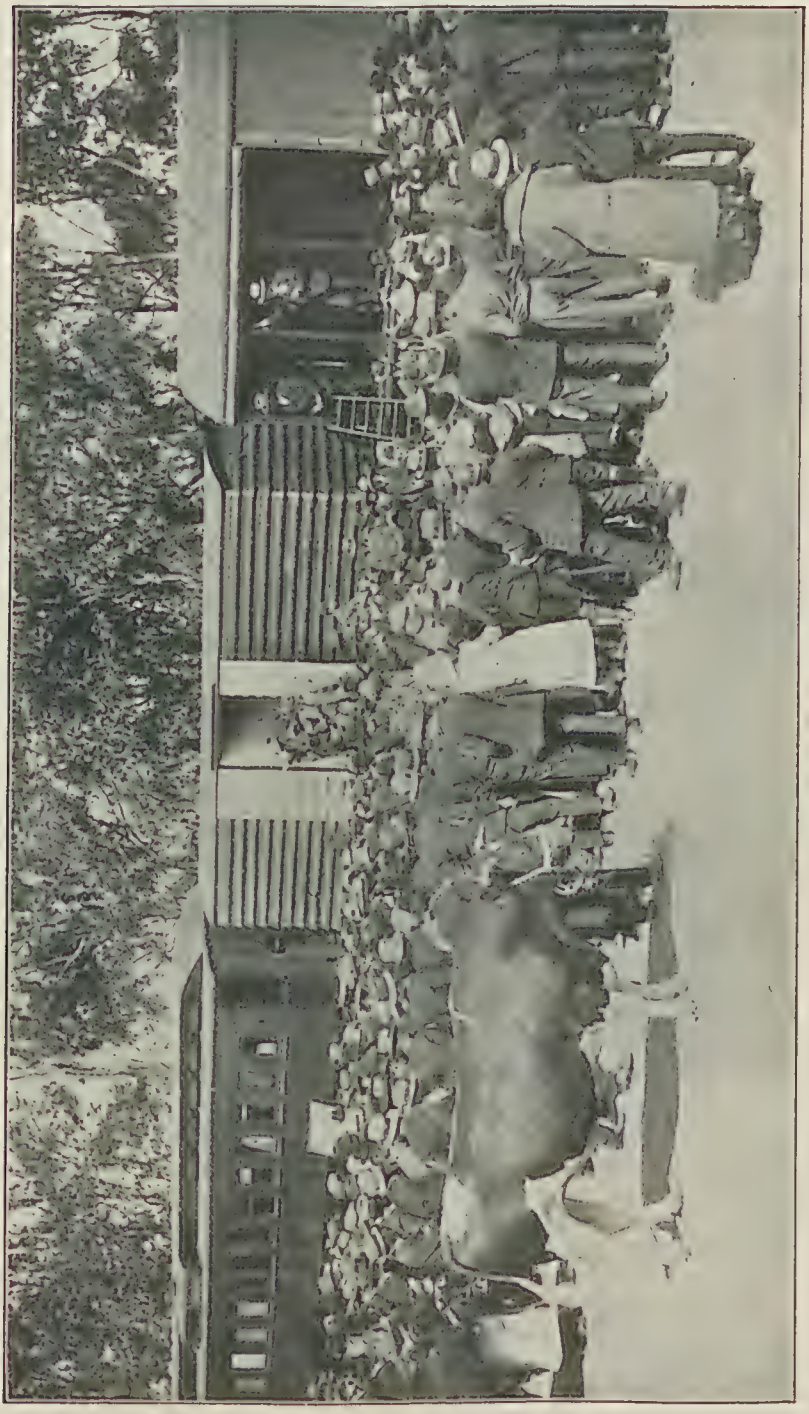
"At each stopping place during the six tours already made, there has been engendered a desire for the purchase of a better class of stud stock, and already numerous purchases of Government-tested bulls have been made.



A Talk on Record-bred Stud Bulls.



Youth Interested—An Encouraging Sign for the Future.



"This goes on all day long."

"Numerous reports are to hand also concerning the purchase of high-class stud pigs for the district which the train has visited, and, in addition, there has been quite a run to purchase rams of the breeds recommended on the train and most suitable for inclusion in the farmers' flocks for the production of export lambs.

Better Farming Leagues Established.

"Such has been the interest aroused by contact with the train and staff that definite organizations and projects have been formed in a direction which gives promise to effect a wonderful change in the attitude of farmers towards scientific help.

The Pasture Fields carried on the Train.

"The first of these is in the establishment of herd-testing associations for the testing of grade herds in many of the districts visited, the second is the establishment of Better Farming Leagues, which have sprung up out of enthusiasm engendered amongst the farmers, leading residents and townspeople of the district visited.

"The main objective of these leagues is to keep up the interest that has been aroused in the application of improved methods by the visit of the train, and the maintenance of a regular and ordered association of local farmers with agricultural educational institutions.

"The popularity of the train has been largely brought about by the perfect co-operation of the staffs of the two Departments concerned, and speaking as Head of the Agricultural Department, I feel

quite sure that the efforts of my staff, which I am afraid has received so far the greater share of the credit, would have been comparatively futile had it not been for the keenness and the very full assistance of the Railway Department.

A Welcome on Arrival of the Train.

"Particularly I wish to emphasize the organization work that can best be done by the Railway staff, and which has been so well performed by them, and without which the value of the project would have been very seriously diminished."—[Reprinted from the *Victorian Railways Magazine*, October, 1925.]

DEVELOPMENT OF PASTURE LANDS.

Grass is Nature's forage, the healthiest and most nutritious food for live stock. Australia's native grasses are justly famous for their grazing and drought-resistant qualities. They are noted for producing the finest and best wool in the world, and for withstanding great extremes of heat and drought. No other plants have proved equal to our own for the drier parts of Australia. Though the pasture plants of the dried portions of Australia are unrivalled for their grazing and wool-producing value, introduced grasses and clovers thrive exceptionally well in the moister coastal region. While, therefore, we should continue to rely on native grasses for the great bulk of our pasturage, we should not hesitate to use introduced grasses, clovers, and fodder plants in the moister regions of Australia, where the soil and climatic conditions are very favorable for their development. It is a matter of common observation that many native pastures shew signs of deterioration. The most important causes of deterioration are—(1) Overstocking and injudicious grazing, and, (2) the continual removal from the soil of mineral nutrients.—*South Australian Journal of Agriculture.*

THE FEEDING OF LIVE STOCK.

J. E. Thomas, B.Sc., B.V.Sc., B.Agr.Sc.

In these days of high production costs, the feeding of farm animals is becoming a problem of increasing importance. In the older countries, where animals are stall-fed for a great part of the year, the balancing of economic rations has reached a fine art. In England, over the centuries, the significance of live stock in a permanent agriculture has been realized, and the maintenance of soil fertility is ensured by the marketing of most crop products through live stock.

By this means and the judicious use of artificial manures the fertility of the land is not impaired.

In Victoria the first pioneering stages are passing rapidly, leaving behind them, in many instances, a legacy of "worked-out" lands.

In the attempt to bring back such areas, the incorporation of live stock in the rotation, and their judicious feeding, will be a major factor. The relation between live stock and soil fertility is fairly obvious. An animal returns to the soil a large portion of the organic matter it consumes. This builds up the humus reserve of the soil —chemically, this liberates nitrogen for the use of plants; physically. it increases the water-holding capacity of the soil and vastly improves the texture, and, biologically, it nourishes those organisms which fix the nitrogen of the air and make it available for plants in the form of nitrates.

The depletion of mineral matter, notably phosphoric acid, is another important factor. The animal returns to the soil a great part of the nitrogen ingested in the food; the lime, potash, and phosphoric acid are similarly, to a large extent, returned, and the only loss to the farm is the mineral matter in the skeleton and body of the animal, or in the form of wool or milk.

These latter losses, with the exception of milk production, are small compared with the loss sustained if the foodstuffs used in feeding the animals are sold off the farm.

In our genial climate the natural production of nitrates in the soil by bacterial agency is so rapid as to render our lands, save for irrigated agriculture and intensive crops, independent of expensive nitrogenous manures.

We may then say that the pressing need is for the restoration of humus and the necessary minerals to the soil. It has been shown that usually phosphoric acid alone is required to restore the balance of minerals.

Continual cropping, bare-fallowing, &c., have all depleted the humus and mineral reserves of the soil. This loss is always great in the new stages of a country where the first settlers live on their capital in the shape of the natural fertility of the soil. The restoration of this is a difficult matter, and the practicable methods are—

1. Use of live stock in feeding down forages, crops, pastures, and in using up all surplus cereal grains and products.
2. Artificial manuring to restore the depleted minerals. Phosphatic manures, particularly the water-soluble ones, alone give a satisfactory response. Nitrogenous and potassic, save in special cases as before quoted, usually fail to give any return.

The scientific feeding of animals has been thoroughly investigated by many European and American workers, and, as a result of their work, we possess much exact and much general information as to the nutritive requirements of animals and the nutritive values of stock foods.

It is sufficient to say that at the present time there are five substances involved; they are Protein, Fat, Carbo-hydrates, Mineral matter, and Vitamines, though in formulating a ration the Protein, Fat, and Carbo-hydrates are alone stated.

The proteins are complete substances—the fundamental point being that they contain nitrogen, whereas fats and carbo-hydrates are nitrogen free. They are irreplaceable in the body, and are important for growth, mainly in the form of muscle, in replacement of body wear and tear, for milk production, and may also be used as a readily available supply of energy for work.

A development within recent years is the relative values of the different proteins. It is now known that protein consists of twenty "building stones" or amino acids, each of which in the body has some special purpose. Many proteins, particularly the vegetable ones in maize and barley, are termed unbalanced, and the proportions of the constituent amino-acids are not the correct ones for complete utilization by the body. Again, in some instances, certain of these amino-acids are entirely absent, rendering the protein of still less value. As might be expected, milk and meat proteins are well balanced.

It must be pointed out that there are other nitrogenous constituents in plants, particularly in growing plants, which are not true proteins. They are probably in the building-up stage to form true proteins, and are termed amides. The relative values of these compared to protein is a disputed question, though the consensus of modern opinion is that there is little difference in nutritive value. In stating protein these compounds are included under the term Crude Protein.

The functions of fat and carbo-hydrate are almost identical. They both undergo a slow combustion in the body with the formation of body heat, which is available for carrying out the work. The excess of digested fat and carbo-hydrate is laid on as fat in the normal animal.

Carbo-hydrates exist as starches, gums, sugars, and cellulose—the latter forming the bulk of the framework of plants, and being much less digestible than the sugars and starches. The amount of energy available from fat is much greater than from carbo-hydrate. This value depends on the particular fat, and, again, as the methods of fodder analysis are slightly inexact, inasmuch as crude fat represents other substances than true fat, its heat equivalent in terms of carbo-hydrate varies from 1.95 to 2.50 with an average of 2.3. The heat values of protein and carbo-hydrate in the body are identical.

A conventional division of carbo-hydrate is soluble carbo-hydrate and crude fibre. This latter value is an index to the type of food—whether it is a roughage, and thus entailing a low digestion co-efficient and a high cost of digestion, and is therefore a valuable guide as to the value of a foodstuff.

The relation of the protein to fat and carbo-hydrate or of nitrogenous to non-nitrogenous food elements is one which is involved in the balanced ration. By the term balanced ration it is meant that

the requirements of the animal in regard to the three constituents—protein, fat, and carbo-hydrate—are being met with a minimum of waste. The requirements will, of course, vary according to the purpose desired—it may be merely for maintenance, or for milk production, for work, or for fattening.

Excess of protein is thrown out of the system by the kidneys and wasted, and excessive fat and carbo-hydrate to a large extent escape and impede digestion. In each case loss is entailed, and an unnecessary strain is put on the animal system.

To avoid this loss, to make gains at a minimum of cost, is the art involved in the balancing of rations.

No standards have ever been adopted for mineral matter. We know that lime and phosphoric acid are the two essentials needed in building up the skeleton, and enter in association with other minerals in the manufacture of proteins.

As a rule, the ash of Australian plants is relatively lower in these constituents than European, and there is now known to be an approximate correlation between the available mineral supply in the soil and the ash of herbage. In dairy farming a special case arises, and by years of specialization an animal has been developed which in many instances will drain her skeleton of minerals in order to transfer them to her milk.

Here in Victoria the supply of mineral matter to high-producing cows is one of real importance. The supply of foods high in mineral matter is essential. Lucerne hay and other legumes and concentrates are usually rich in this respect, and they may be directly supplied in the form of bone-meal, in licks containing superhosphate, lime and salt, or again the pure substances might be used, such as sodium phosphate.

There are also stretches of country—notably old sheep runs—where the supply of minerals in the natural herbage is insufficient to supply enough for the skeleton or for milk production, and where nearly all dairy cows, both high and low producers, are affected with cripples and kindred disorders. The rational method here is to feed the cow through the soil, and the striking success of top-dressing bears witness to its value.

Vitamines are of recent discovery, and to date little is known of them save that they are in some way essential for life and growth. So far, three substances, and, possibly, a fourth have been determined. In order they are —Vitamine A, fat-soluble, found especially in green plants and animal fats and oils; it is essential for growth. Vitamine B is water soluble, and is essential for the proper functioning of the nervous system; it is very widely distributed in cereal grains, &c. Vitamine C is the anti-scurvy one; it is widely distributed, especially in juices of plants. Vitamine D is not yet definitely marked off from Vitamine A; both are found in association with fats, and Vitamine D is termed the anti-rickets vitamine, as it apparently is necessary for the proper assimilation of lime for the use of the growing skeleton.

In experimental work with vitamines much confusion existed in the past, inasmuch as the importance of mineral matter and the proper balancing of protein were not sufficiently attended to.

Reviewing their possible lack in the animal world, Vitamines B and C are so widely distributed that any normal ration will contain plenty of them. Vitamines A and D, however, are often suspected of being lacking.

In using separated milk, which is low in Vitamine A, the use of cod-liver oil, which is especially rich in this vitamine, has come into vogue in rearing pigs and calves.

How far green-leaved plants, which are also known to be rich in this vitamine, would replace cod-liver oil is a point in urgent need of experimentation.

Within the last few years in the United States the well-known difference in the value of yellow as against white maize in the feeding of pigs in stys has been ascribed to the presence of vitamine A in yellow corn, since chemical analysis alone showed but little difference. It is interesting to note that when green pasturage was allowed to pigs fed on white maize there could be seen but little difference between them and those fed on yellow maize.

The ideal ration should therefore conform to all the requirements of the varying factors specified—

(1) It should contain sufficient nutrients, and be so balanced in regard to the relation of nitrogen to non-nitrogenous elements, i.e., protein to fat and carbo-hydrates, as to ensure that the requirements of the animal in this respect are satisfied with a minimum of waste.

(2) It should have sufficient and not excessive bulk to ensure thorough digestion. This is obtained by laying down standards for dry matter.

(3) It should be palatable to ensure its being eaten and thoroughly digested.

(4) It should contain an adequacy of mineral matter and vitamines, and the proteins must be well balanced.

(5) With due regard to requirements 1, 2, 3, and 4, it should be the most economical with the foodstuffs available.

Methods of Stating Rations.

An ordinary chemical analysis shows the constituents present. This is not sufficient. Only a portion of each constituent is digested. This portion is fixed by a digestion trial. An analysis is made of the food taken in, and the excreta, and thus it can be determined what part of the protein, fat, or carbo-hydrate has been digested and absorbed. By this method the co-efficients of digestion for the protein, fat, and carbo-hydrates of that foodstuff are determined, and the digestible nutrients per 100 lb. of the foodstuff obtained.

Table I.—Digestible Nutrients per 100 lb.

	Protein.	Fat.	Carbo-hydrates.
Lucerne hay	10·6	·09	34·0
Bran	12·5	3·0	41·6
Wheat hay	4·0	·8	48·5
Linseed	30·2	6·7	32·6

The nutritive requirements for animals have been carefully studied, and, in the case of cattle, the maintenance ration is expressed in terms of 1,000 lb. live cut. To ensure, in addition, sufficient nutrients for milk production with an allowance for the richness of the milk tables have been drawn up. The Henry-Morrison table is shown below. In this, fat is expressed in terms of carbo-hydrates by the use of the factor 2.25, and is therefore included under total digestible nutrients.

TABLE II.—NUTRITIVE REQUIREMENTS FOR DAIRY CATTLE (HENRY—MORRISON).

Dairy Cattle.	Digestible Crude Protein.	Total Digestible Nutrients.
	lb.	lb.
For maintenance of 1,000-lb. cow	0·700	7·925
For every lb. of 2·5% milk add	0·045—0·053	0·230—0·256
„ „ 3·0% „	0·047—0·057	0·257—0·286
„ „ 3·5% „	0·049—0·061	0·284—0·316
„ „ 4·0% „	0·054—0·065	0·311—0·346
„ „ 4·5% „	0·057—0·069	0·338—0·376
„ „ 5·0% „	0·060—0·073	0·362—0·402
„ „ 5·5% „	0·064—0·077	0·385—0·428
„ „ 6·0% „	0·067—0·081	0·409—0·454
„ „ 6·5% „	0·072—0·085	0·434—0·482

From these standards and tables of digestible nutrients rations can be built up.

It was soon recognized that the previous method possessed one drawback—it took no account of what may be termed the cost of digestion. In order to masticate, digest, and assimilate the nutrients, work must be done, and it is very obvious that it takes much more to digest a fibrous straw than a concentrate like linseed. The balance alone is available for the animal for production, either (1) to put on fat, (2) to do external work, (3) to replace wear and tear, (4) to secrete milk.

The determination of this amount was one of extreme difficulty. It demanded the use of a respiration calorimeter wherein an animal was confined and fed. All foods consumed, all excreta, the gases inhaled and exhaled were analyzed, and, in addition, the heat value of the food was determined, as also the amount of heat given out by the animal, and the heat value of the excreta. By this means a balance-sheet for the subject could be drawn up, and the actual balance available for the animal was determined. This figure has been stated in two ways, (1) net energy, (2) starch equivalent.

Energy—the capacity to do work—exists in many forms; in the body it exists as heat energy, as in the steam-engine. The heat value is defined in therms, the amount of heat required to raise 1,000 kilograms of water through 1 deg. centigrade. Net energy is the energy available for the animal after paying for the cost of digestion and deducting the energy value of the body excreta.

It is really by means of this term that roughages as against concentrates are differentiated. There is a close relation between fibre content and net energy, and it may be stated that the higher the fibre content of the food the higher the cost of digestion and the lower the net energy. Lucerne hay, though rich in protein, is yet a roughage, as the fibre content is high.

Starch equivalent is a term more usually applied. It is defined as the amount of starch that has the same fat-producing value as 100 lb. of that foodstuff. The terms starch equivalent and net energy are of the same meaning, and though the tables prepared are by different workers in different countries, an approximation can be obtained. The factor 1.971 x starch equivalent equalling net energy expressed in therms per 100 lb. may be used.

In the tables prepared the irreplaceable nature of protein is recognized by adopting a minimum for protein.

TABLE III.—ARMSBY'S NET ENERGY STANDARD.

—	Digest True Protein.	Therms.
Maintenance 1,000-lb. dairy cow	·50 lb.	6·0
To maintenance add for each lb. of 4·0% milk	·049 lb. &c.	·265

It will be noted that Armsby states his protein as true as against crude protein, hence the lower figure than that of Henry and Morrison. He has similarly prepared tables of the common feeding stuffs showing the content of the net energy contained in 100 lb. of each.

TABLE IV.—NUTRITIVE VALUE OF BARLEY GRAIN, 100 LB. (ARMSBY).

Total Dry Matter.	Digest True Protein.	Net Energy.
lb.	lb.	therms.
90·7	8·3	89·94

This method is not in general use owing to the very limited amount of investigational work done.

The system, using Kellner's starch equivalents, is in very general use in England, and rations calculated on this system show—

TABLE V.—NUTRITIVE VALUE OF OATS (100 LB).

Total Dry Matter.	Digestible Crude Protein.	Starch Equivalent.
lb.		
86·7	8·0	59·5

TABLE VI.—STANDARDS FOR A 1,000-LB. MILK COW.

Total Dry Matter.	Digest Protein.	Starch Equivalent.
lb.		
20–24	0·7	6·5

For each gallon of milk secreted add 2.25 lb. starch equivalent, including .6 lb. digestible protein—the amount varying with the richness of milk.

TABLE VII.—SHOWING APPROXIMATE BETWEEN KELLNER'S STARCH VALUES AND ARMSBY'S NET ENERGY USING FACTOR 1.071.

——	Starch Equivalent.	Therms. per 100 lb.	Armsby's Net Energy. Therms per 100 lb.
Oats	59·5 × 1·071 =	63·94	67·56
Maize	81·5 × 1·071 =	87·28	84·00

It will be noted that the use of this factor gives a close approximation for cereal grains, but roughage, straws, &c., show a wider deviation, as might be expected from their varying composition.

The term nutritive or albuminoid ratio is one very widely employed. This is the ratio between the digestible protein to the sum of digestible carbo-hydrates and fat expressed as starch. The heat value of fat is taken as from 2.25 to 2.30 times that of carbo-hydrates or starch.

TABLE VIII.—NUTRITIVE VALUE OF BRAN.

Digest Protein = 10%
„ Fat = 3%
„ Carbohydrate = 45%

$$\text{N. ratio} = \frac{3 \times 2{\cdot}3 + 45}{10} = 5{\cdot}2$$

TABLE IX.—NUTRITIVE RATIOS AND STARCH EQUIVALENTS.

	Nutritive Ratio.	Starch Equivalent.
Linseed	1 : 2·3 ..	75
Wheat straw	1 : 71 ..	12
Lucerne hay	1 : 3·9 ..	30

In feeding a balanced ration, the correct nutritive ratio may vary 1 : 5 to 1 : 6 for milking cows, and may be much wider, i.e., contain much less protein comparatively, for fattening stock or working horses.

Protein is normally the most expensive item in the food, and to ensure economical feeding it is not advisable to over-feed in this respect.

The requirements are much less in the case of working and fattening animals since carbo-hydrates and fats will suffice for heat production, for work and the laying on of fat. Protein can also supply heat energy and possibly fat, but it is too expensive, and is only wanted for this purpose in special cases.

The requirements for cows on official test is slightly different. It has been found that protein may have some cell-stimulating function and when fed in amounts over that required for milk and maintenance may, in responsive cows, give rise to a very definite increase in the flow of milk. This is not normally justified from the point of view of cost and the strain on the animal, but it is often done, when records are in view, and is, of course, valuable as it picks out the responsive cows, i.e., those of a very pronounced dairy temperament. To obtain some accurate information on this point experiments are at present under way at Werribee.

Comparative Value of Foodstuffs.

Many methods of valuing foods have been devised. All must be accepted circumspectly, since every food has some special feature. Rice products fed to pigs are known to produce a soft pork. Undecorticated cotton-cake is valuable as a preventative of scouring; the laxative effect of bran is similarly a beneficial feature.

The cost per lb. of digestible nutrient expressed as starch may be stated, but this takes no account of the special value of protein.

Another method more generally used as a closer approximation is as follows:—

$$(\text{Digest Protein} + \text{Fat}) \times 2.5 + \text{carbo-hydrate},$$

giving the number of food units present which may be divided into cost per ton to get the cost per unit. This formula takes into account two factors—

(1) Special value of protein.
(2) Special value of nitrogen in manure.

So strongly are the old world farmers convinced of the value of feeding on the farm that the manurial values of all foodstuffs purchased have been laid down using the unit manurial values of potash, nitrogen, and phosphoric acid. The actual cost to the farmer is the purchase price less the manurial value.

Table X.—Showing Manurial Value of Linseed Cake and Approximate Money Value of its Chief Constituents.

Nitrogen.	Phosphoric Acid.	Potash.
4·7%	1·7%	1·3%

Allowing a unit value of 19s. for nitrogen.
Allowing a unit value of 2s. 8d. for phosphoric acid.
Allowing a unit value of 4s. 10d. for potash.
Then allowing $\frac{1}{2}$ for nitrogen, $\frac{3}{4}$ for potash and phosphoric acid.

Value per ton nitrogen, 4.7 x 19s. x $\frac{1}{2}$ =	£2	4	6
Phosphoric acid, 1.7 x 2s. 8d. x $\frac{3}{4}$ =	0	3	4
Potash, 1.3 x 4s. 10d. x $\frac{3}{4}$ =	0	4	8
Total	£3	0	6

These tables are, of course, not altogether applicable here where intensive agriculture is not so generally practised, but the illustration will serve to show a value of concentrates which is often not considered.

PROBLEMS IN VICTORIA.

Feeding of Dairy Cows.

Experimental work must go hand in hand with the theoretical balancing of rations as before outlined. So many other factors arise other than the apparent nutritive value as to render experimental work a necessity. Tables worked out with American and European foodstuffs under their conditions cannot in all cases be applied here.

In the dairying industry the aim here has been to conjoin testing and feeding. By the Standard Herd Test the best strains of pure blood are isolated, and by means of the Herd Testing Societies the best stock

similarly. The aim is to pick out the high-yielding cows and feed these to the economic limits.

There is no question as to the wisdom of feeding high-producing cows—similarly there is no doubt as to the dead loss in feeding low producers. The higher the yield—within limits—the lower the cost of production of butter-fat.

The reason is obvious—a cow yielding 500 lb. of butter-fat requires the same maintenance ration as one yielding half that quantity, and the maintenance ration often approximates from one-third to one-half the total ration fed.

The determination of the special nutritive values of the concentrates on the market, and above all, a comparison of the relative values of home-grown products against purchased concentrates, are urgently needed.

Such questions as the values and costs of crushed oats, barley and maize against bran and the economic limits of replaceability of bran by lucerne hay would come under this heading.

That there is a strong sentiment as to the values of stock foods is evidenced by the Stock Foods Bill recently brought before Parliament. A special study under Australian conditions is the mineral problem. Experimental work is required to show the effects of a lack of lime, phosphoric acid, iodine, and salt in the ration, and the response to feeding these, and their influence on the health of the animal and the milk yield.

It will be seen that the purchase and successful utilization of foods is a task requiring some skill, particularly when natural pastures are not readily available, as in suburban dairies, or where a uniform milk supply is required the whole year round.

Under natural conditions, for the spring months at least, the cows are on a balanced ration, but when the natural herbage begins to fail, two courses are open. In order to get a uniform milk supply and distribute the labour more evenly, the proper provision of a food supply is of great importance. If the rainfall and the climatic conditions are suitable, summer crops can be grown, and either fed as soilage or ensiled. The latter is a good method, and has the two advantages—

(1) it can be fed as desired, and so secure a uniform food supply;

(2) It has the great merit of succulence when green fodders are not readily obtainable.

It is, then, an economic procedure to purchase concentrated foods to add to the low protein content of these carbonaceous foods to ensure a balanced ration, and hence a lower cost of production per lb. of butter-fat.

In the rearing of calves there are several special problems. The relative values of the high-priced supplements to skim milk and the theories of vitamine deficiency are questions awaiting determination.

Pigs.

In pig-raising, feeding and breeding, tests to show the importance of breeding the bacon pig at the lowest cost are required.

The self-feeder is not common in this country. The Americans are apparently satisfied as to the merits of these labour-saving devices, and

their extensive adoption here is probably only a matter of time. Another innovation here in the feeding of pigs is the grazing of them on lucerne pasturage.

Of all the domestic animals the pig responds most favorably to self-feeding, though it is interesting to record the favorable results obtained from self-feeding fowls for egg production at the State Research Farm, Werribee. It appears clear that these animals bred for a purpose can be trusted to balance a ration for that end.

The marketing of many of our cereals via the pig is one method of getting over the difficulties of the local markets, and it might be noted that there is a growing tendency amongst sheep-men to supplement with hand-feeding the natural pastures when these begin to fail.

Out of a production of 300,000,000 bushels of maize in America, nine-tenths is fed to stock. Here the demonstration of the values of maize and maize products in stock feeding would be very advantageous to the maize industry. Such work might well go on these lines:—

(1) Value as a food for working horses.
(2) Relative values for pork production, and the most economical supplements.
(3) Value of products in milk production.

Fowls.

In the poultry industry it is the opinion of experts that the old adage, "Feed, Breed, and Weed" has been carried out in its entirety in regard to breeding and weeding, and that future advances will come in feeding.

The experimenter here is confronted with several obstacles. Little is known of the nutritive requirements of the fowl. Very few digestion co-efficients have been worked out, as, owing to constitutional variations, the results are different from those obtaining in the case of other domestic animals. The temperature of the fowl is normally 106° F., as against 100-102° for the other animals, that is to say, the fowl works at a high pressure, and will need a readily available supply of energy in its food.

Of the organic matter of the egg 60 per cent. is protein, yet there is apparently no direct relation between egg production and the so-called digestible protein ingested. The only method of attack is by slow experimentation, and a very satisfactory beginning has been made at the Research Farm, Werribee, in determining the relative values of the grains and the prepared foods available.

Conclusion.

From the foregoing it is evident that there is a large field of work open for investigation, and it may be stated there is a corresponding demand for accurate information on these points; and not only should specific problems be attacked, but, in addition, some of the so-called fundamentals laid down by American workers, so that their conclusions may be tested under Victorian conditions.

The relation between live-stock and a permanent agriculture is now being realized. Animal products always have a ready sale, and in view

of the depleted live-stock resources of the world, there seems little danger of over-production. These factors will tend to stabilize those industries, and in turn will naturally lead to the adoption of methods which seem so rational, but which are hampered by the high outlay costs. One such is the conservation of fodder, by silage, &c., for use during periodical dry spells.

At the present time the dairy industry is passing through a stage of depression, due mainly to the disordered condition of the European markets and the keen competition on the British market. In cutting down the production costs in this industry, feeding, associated with testing and rigid culling, will be a most important factor in returning a profit.

In conclusion, it must be recognized that the trend of settlement here is becoming much more intensive. Irrigation is progressing rapidly in Victoria, and holdings are becoming smaller and comparatively dearer, and thus many of the problems of feeding met with in the old world are becoming our problems.

CLASSING FARMERS' WOOL.

(Continued from page 638.)

By George Wallace McDonald, Lecturer in Wool, Melbourne University, and Head of Sheep and Wool Department, Gordon Institute of Technology, Geelong.

Classing Wool of Different Breeds.

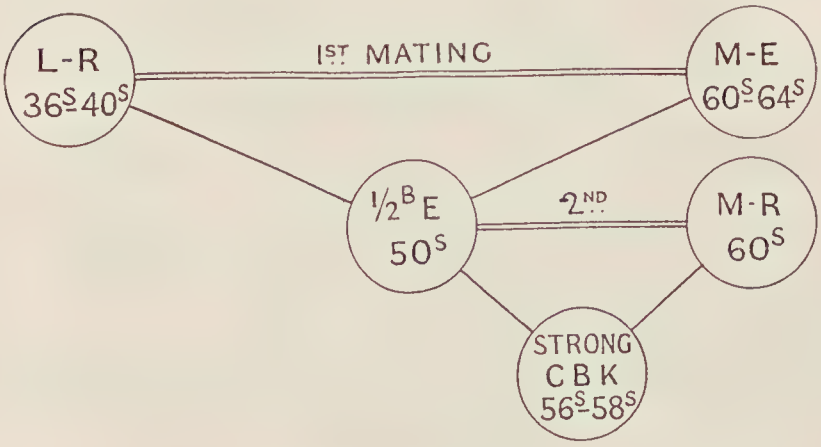
In classing merino wool the determining factors are length, condition, quality, and soundness; in cross-bred wool, quality is the main feature. Before going into detail on the classing of the various grades of wool, it would be well if the reader looked at the diagrams on page 659; these will give him a good idea of how various wools are raised. We know that the wool from the progeny of, say, a Merino ram and a Lincoln ewe will not be all ½B or 50s, but the bulk of the wool from such a flock would be. The same may be said in the case of the other matings specified in the diagrams.

The following tables will give an approximate idea as to the number of lines into which wool should be classed. Perhaps all that need be added is to impress upon farmers that they should always try to make a four-bale lot or more out of their top line:—

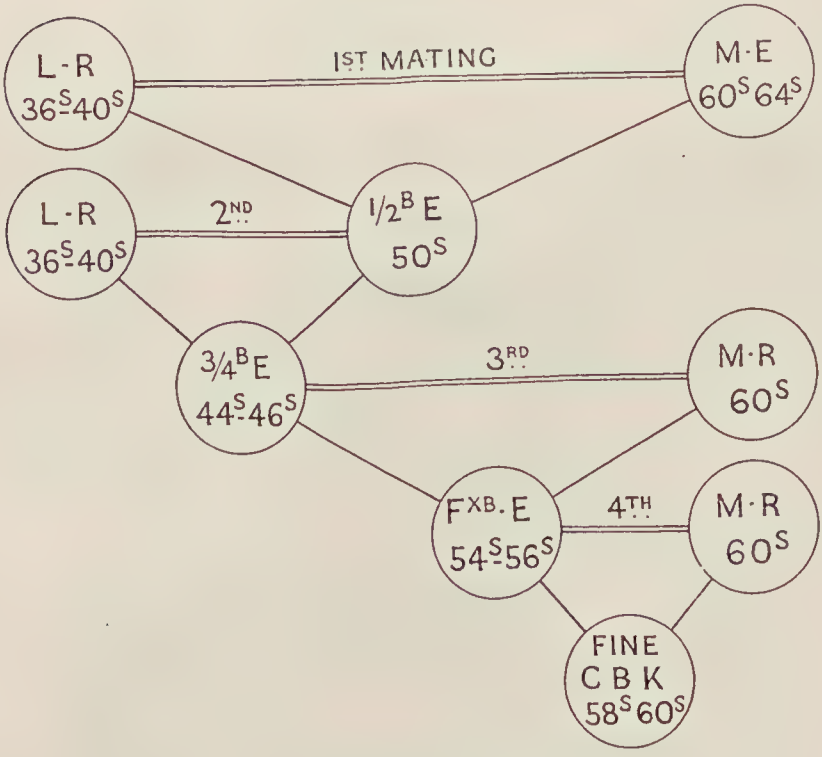
MERINO.

TABLE No. 1.—Up to 100 Sheep:—

1st MER.	All well grown fleeces, light to medium, sound condition.
MER.	All short, tender, or shabby fleeces.
PCS. & BLS.	In same bale (with bag between). Bag stain, also locks, and press in top of bale containing the Pcs. The brokers should be notified of what this lot consists.



Short Way of Providing a CBK.



Long Way of Producing a CBK.

TABLE No. 2.—100 to 500 :—

1st COM.	All well grown fleeces of medium to light condition.
COM.	All short, tender, and shabby fleeces.
A.A. COM.	All strong quality fleeces.
1st PCS.	Best of the skirtings.
PCS.	Seconds and all coarse Pcs.
BLS.	
LKS. & STN.	In same bale (with bag between). The broker should be advised how lot made up.
100 to 500	Lambs—Just keep hairy britch ends stains and sweaty locks out.

TABLE No. 3.—500 to 1,000 :—

1st COM.	All light, long, well grown fleeces (call it super if you so wish).
COM.	Same as above, only heavier in condition.
MER.	All short and shabby fleeces.
A.A. COM.	All strong quality fleeces.
BKN.	Best of skirtings.
PCS.	
LKS.	
BLS.	
STN.	
1st LMS.	All bright, long, and fine.
LMS.	Short and sweaty ends.
STN.	

In large clips it may be necessary to make a super combing and a super Lms., but this should not be attempted if it means a star lot.

COMEBACK.

TABLE No. 4.—Up to 100 Sheep :—

1st CBK.	All well grown fleeces, fairly fine.
CBK.	All fleeces stronger in quality.
	Bag shabby fleeces, also Lks. and stain, and press them in top of bale containing Pcs. and Bls., and so advise brokers. Care should be taken that contents are on bags.
Up to 100	Lambs—Bag stain and britch ends and brand the balance lambs.

TABLE No. 5.—100 to 500 :—

1st CBK.	All long, bright fleeces well grown.
CBK.	All short and shabby Wool.
FXB.	All strong quality fleeces.
1st PCS.	All fine pieces.
PCS.	All strong quality wool.
BLS.	
LKS. & STN.	In same bale (with bag between).
1st LMS.	All bright and fine Lms.
LMS.	All short and sweaty ends, &c.
	Bag all coarse britch ends and stain.

TABLE No. 6.—500 to 1,000 :—

1st CBK.	All long bright and fine fleeces.
CBK.	Same, only heavier in condition.
A. CBK.	All short and shabby.
FXB.	All coarse quality fleeces.
CBK. PCS.	
FXB. PCS.	
BLS.	
LKS. & STN.	
1st LMS.	Bright, fine, and good length.
LMS.	Short and sweaty ends.
	Bag coarse and stained.

In classing most mixed Crossbred clips it is practically impossible to avoid star lots owing to the large range of quality; the only way to do so is by purchasing sheep with wool of as nearly even quality as possible.

MIXED CROSSBRED.

TABLE No. 7.—Up 100 :—

FXB.	Put Cbk. and ¼B. wool together.
XB.	All the coarser fleeces.
	Put Bls. and Pcs. together.
	Bag locks and stain.
LMS.	Just keep stain out.

TABLE No. 8.—100 to 500 :—

CBK.	
¼B.	
½B.	
¾B.	
CXB.	
FXB. PCS.	All skirtings from Cbk. and ¼B.
XB. PCS.	All skirtings from the coarser fleeces.
LKS. & STN.	In same bale (with bag between).
FXB. LMS.	All Cbk. and quarter bred.
XB. LMS.	All coarser wools.
	Bag stain.

TABLE No. 9.—500 to 1,000 :—

CBK.	Pcs. from Cbk. and ¼B. brand FXB. PCS.
¼B.	
½B.	Pcs. from ¼B. brand MXB. PCS.
¾B.	Pcs. from ¾B. and CXB. brand CXB. PCS.
LXB.	
FXB. PCS.	Pcs. from CBK and ¼B.
MXB. PCS.	Pcs. from ½B.
CXB. PCS.	Pcs. from ¾B. and LXB.
FXB. BLS.	Fine.
XB. BLS.	Strong.
FXB. LMS.	Throwing out all stain, &c.
MXB. LMS.	
CXB. LMS.	

(To be continued.)

PLUM AND PRUNE CULTURE.

(Continued from page 618.)

By J. M. Ward, Superintendent of Horticulture.

Propagation and Re-working.

Having selected the desired kind and correct type of stock (see Fig. 6A below and also Fig. 4 in this *Journal* for October), the propagator looks around for buds or for scions of the variety of plum he is

Fig. 6A.

a Plum stock propagated from a cutting.
b Plum stock grown from a seed.
Note different rooting systems.
c and *d* Plum stock propagated from cuttings. Note poor rooting habit. Such stock as these are not recommended for planting in commercial orchards.

desirous of "working." In this respect it is always good policy to select buds or scions (as the case may require) from the most vigorous and productive trees in the district. The writer is of the considered

opinion that this is a matter that should be given greater attention than it has hitherto generally received.

There are two methods of propagating or "working" plum stock; one is by budding, the other by grafting. The first-named is the method mostly in vogue in the commercial nursery, whilst grafting is chiefly used when "top-working" is required, i.e., changing over from one variety to that of another.

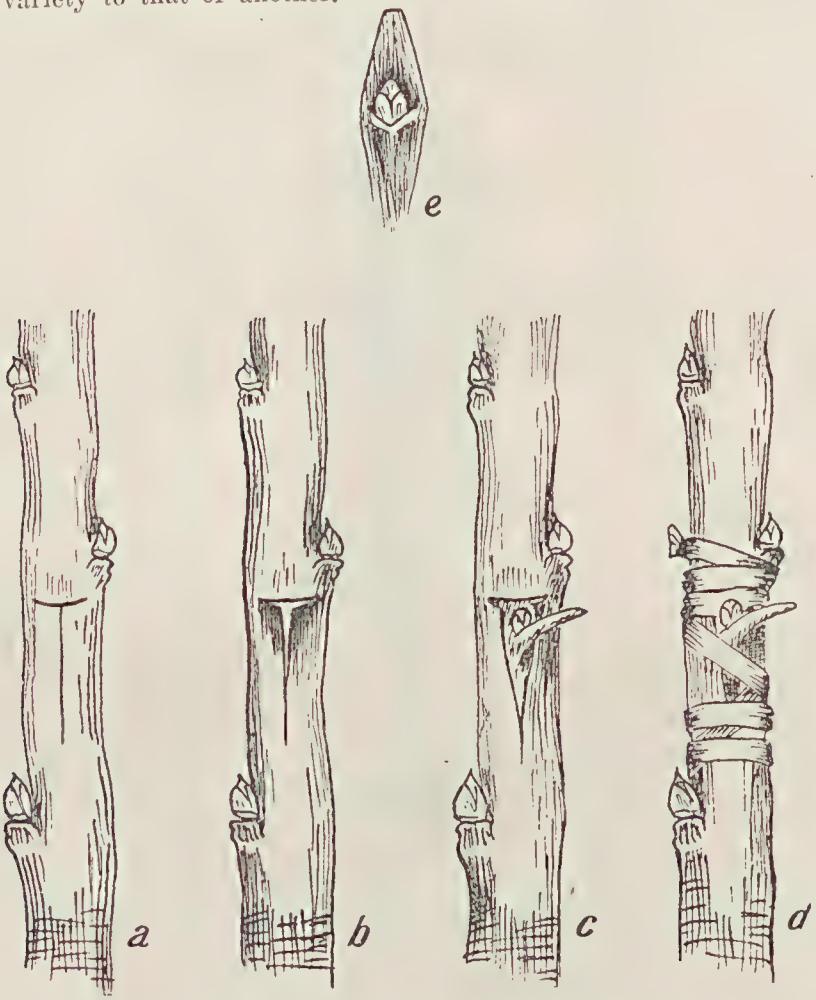


Fig. 7.

(*a*) T-shaped cut in the stock. (*b*) The bark raised ready to receive the bud. (*c*) The bud inserted ready for tying. (*d*) The job completed. (*e*) A well developed bud.

Budding is carried out during the months of December, January, and February, when the sap is running freely, and should be on the current year's growth. The operation is a simple one, and with plenty of practice can be quickly done. Only well-developed buds should be used; the bud is inserted just under the bark (next to the cambium layer) in a T-shaped cut made in the stock (see Fig. 7); it is then carefully and securely tied with raffia or string. The bud is left in

this condition until a good union results. The tie is then cut or loosened, the bud remaining dormant until the following spring. During the winter or early spring months the growth is cut off just above the newly inserted bud, and the new growth from this bud becomes the future tree, or main arm of the tree, as the case may be.

For obtaining successful results in budding, the following are important points:—

(1) Use a very sharp knife; (2) use only well matured buds; (3) bud when the sap is running well; (4) do not allow the sap on either bud or stock to become dry or brown; (5) the tie should receive attention

Fig. 8.—A Whip Graft.

a few weeks after budding takes place; (6) six weeks or so after the bud commences to grow the new growth may require attention by way of staking or pinching back to prevent damage by wind.

In regard to grafting, there are a number of methods of performing this; the most commonly known are:—The Whip or Tongue graft, the Saddle graft, the Rind or Bark graft, and the Strap graft.

Whip Graft.

This method is used when scion and stock are of somewhat similar dimensions. It is both simple and effective. From three to five main limbs with young growth thereon are selected, and a graft or scion placed on to them as follows:—

Each limb is cut so that a long—1 inch to 1½ inches—smooth, slanting surface is obtained. This operation should be carried out by making one clean cut with a sharp knife.

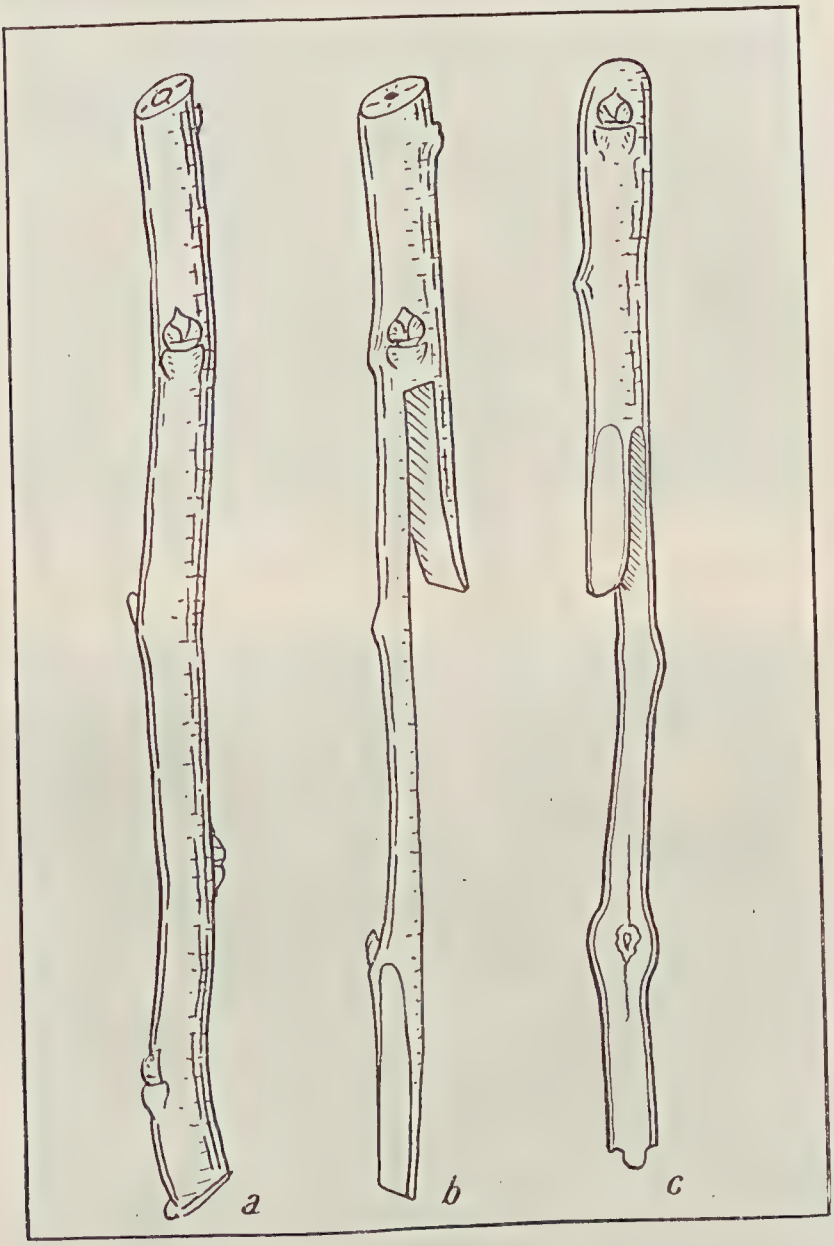


Fig. 9.

(*a*) The scion ready to be prepared for the strap graft. (*b*) The same scion after preparing, showing small portion of bark removed from the back part of the "strap." (*c*) Another view of the scion, illustrating where bark has been removed from another part of the scion.

The scion is treated similarly, and a small "tongue" made in the surface of both stock and scion. (See Fig. 8.)

A union is made by bringing the cut surfaces together so that the two tongues fit into each other. Care must be taken to see that the cambium layer (inner bark) of both limb and scion come in contact with each other. The grafted portions are then tied tightly with raffia or other suitable material, and the whole is waxed over. The whip graft is used for young stock to a greater extent than is any other graft.

Saddle Graft.

This was practised to some extent years ago, but as better methods are now in vogue it is not recommended.

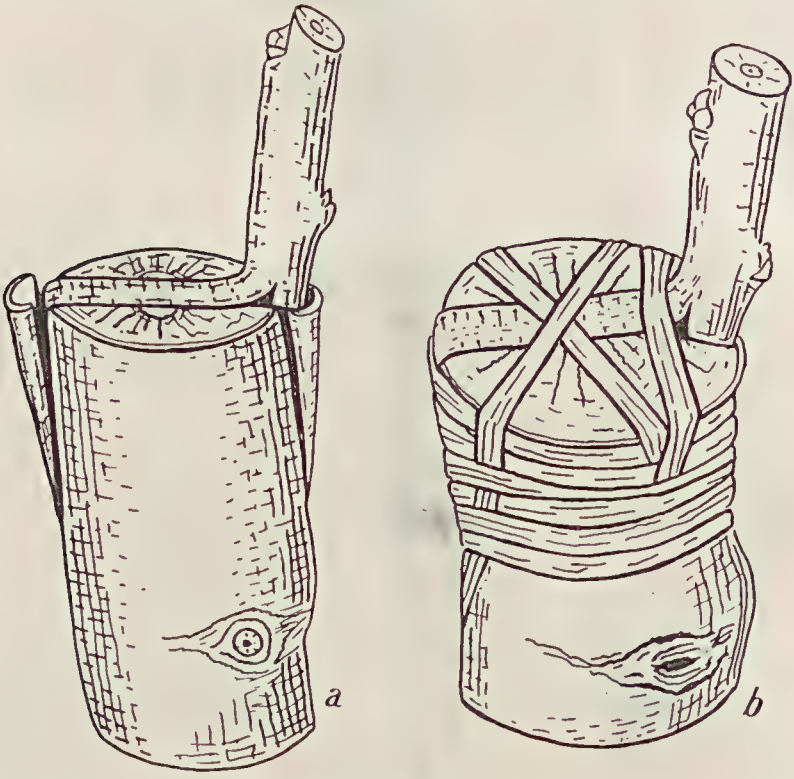


Fig. 10.

(*a*) The scion of the strap graft inserted ready for tying. (*b*) After tying and awaiting waxing.

Rind or Bark Graft.

This method is employed for the reworking of trees having limbs an inch or more in diameter. The tree is cut down to about 5 or 6 inches above the "crotch" (where the main limbs branch out from the trunk), selection being made of those parts which are in the best

Fig. 11.—A "Strap" Graft, Three Years Old.
Note that the strap is gradually growing over the cut surface of the stock.

Fig. 12.—A "Strap" Graft, Five or Six Years Old.
The cut surface of the stock is almost covered by the growth of the "strap."

Fig. 13.—A "Strap" Graft, Five or Six Years Old, which has Completely Covered up the Cut.

Fig. 14.—A Twenty-year-old Tree which has been "Top-worked" by the "Strap" Graft Method.

Note the complete absence of cut surfaces, with the result that there is no dead or decayed wood.

position to receive the scion. This is then prepared in a somewhat similar manner to the scion as described in the "Whip Graft," but no "tongue" is made. A small portion of the bark at the opposite side of the cut is, however, removed; by doing this a better "take" is effected. The bark on the stock is then prepared to receive the scion. This can be done in two ways. One is to make a simple cut with the point of the knife; the bark is then gently eased away

Fig. 15.—Robe de Sergeant Prune "Top-worked" to Apricot Stock with the "Rind" Graft.

Note decayed portion on trunk where grafting had been done.

from the wood and the scion slipped in. The other is to make two cuts in the bark about half an inch apart; the bark is pushed away whilst the scion is put in. The latter method is probably the more successful of the two.

As soon as the scion is in place, it should be tightly tied, and waxed. Good and secure tying is an important item in grafting.

Strap Graft.

For trees of similar size to those mentioned in the "Rind or Bark" graft, or even for trees with limbs up to 6 inches in diameter, there is no better known method of grafting than the "Strap," so named by the "strap" which crosses over the cut surface of the limb. The scion is then cut in such a manner that a long strip of bark, together with a little wood attached, is partly removed; this forms the "strap" (see Fig. 9). The wood from which the cut has been made is then removed by making a slanting cut about an inch and a half long on the opposite side to that where the "strap" was cut. The length of the "strap" cut should be the diameter of the stock, plus about an inch and a half. The scion is then ready for insertion into the stock, which is prepared in the same manner as explained in the "Rind or Bark"

Fig. 16.—A Close-up View of the Same Tree as shown in Fig. 15.

graft, with the addition that the bark is also eased from the opposite side so that a portion of the "strap" is inserted on one side, and, in addition, to the same scion on the other side. (See Fig. 10.)

The whole is then securely tied and waxed. The "strap" taken across the face of the stock will in the course of a year or two grow in such a manner that the cut becomes well covered up.

Although the explaining of the "strap" graft takes some little time, the work itself can be carried out rapidly.

The great advantage the "strap" graft has over any other graft for the "top-working" of established trees is that the cut surface of the stock is covered over by the "strap" within a few years of the operation. (See Figs. 11, 12, 13, and 14.) In addition to this, there is more stability in the tree as a whole for many years after.

With the "Rind" graft there is every probability of the cut not becoming covered by the new growth of the scion, resulting in the old wood decaying, leaving a hollow in the original trunk of the tree. This is well illustrated in Figs. 15 and 16. Owing to this decay taking place the tree becomes a weak one, and sooner or later breaking down of the branches occurs (see Fig. 17), resulting in a heavy loss to the orchardist.

Fig. 17.—Result of allowing Wood on Prune Trees to Decay. "Strap" Grafting would have Prevented this.

The Making of Grafting Wax.

There are several recipes for making grafting wax. A simple one is to melt together 1 lb. beeswax, 1 lb. tallow, ¾ lb. resin; this can be used either hot or cold.

(To be continued.)

GOVERNMENT HERD TESTING.

RULES FOR UNIFORM AUSTRALIAN SCHEME.

Some confusion having arisen concerning the rules and conditions under which the testing, by the State Department of Agriculture, of pure-bred herds is to be conducted in accordance with the resolutions arrived at by the conference of State Ministers for Agriculture in May, 1923, the following extracts from the report of that conference, being the whole of the references to the subject in the report, are published for general information:—

Extracts from the Official Report of the Proceedings of Conference of Ministers for Agriculture held at State Parliament House, Melbourne, from the 1st to 4th May, 1923.

AGENDA ITEM 10. HERD TESTING (VICTORIA):—

(*a*) Adoption of common basis for testing and recording of yields of pure-bred dairy herds.

(*b*) Consideration of reports of Officers' Conference on Herd Testing.

The report of the Officers' Conference on Herd Testing in Sydney, 27th and 28th March, 1923, was read. It was shown that the conference was agreed on nine items on which there was a previous difference of practice in the different States, and that it disagreed on five items. The report was referred to a committee, comprising the Directors of Agriculture present, with a view to their endeavouring to arrive at full agreement, and to report to the conference.

The committee, later, submitted a report.

Resolved—

That the recommendations of the Committee of Directors of Agriculture on Herd Testing be adopted. (See Appendix "D.")

APPENDIX "D."

REPORT OF COMMITTEE OF DIRECTORS OF AGRICULTURE ON HERD TESTING.

RECOMMENDATIONS.

That items Nos. 1 to 9 of the report of the Officers' Conference on Herd Testing be adopted. These are as follow:—

1. There could be no uniformity unless the system of herd testing in each State was controlled by the Department of Agriculture, and certificates issued by such Departments.
2. The official lactation period shall be 273 days, which may be extended to 365 days on request of the owner.
3. The lactation period to commence five days after calving.
4. All reference to commercial butter should be dropped in all States, and records published in milk and butter-fat only.
5. When a breeder owns more than one herd on separate farms, each herd shall be considered and recorded as a separate herd.
6. Records of all cows shall be published—both those which attain the standard and those which fail to do so.

7. The standards upon which certificates shall be issued to be as follows:—

Junior, 2-year-old	200 lb. butter-fat.
Senior, 2-year-old	225 lb. butter-fat.
Junior, 3-year-old	250 lb. butter-fat.
Senior, 3-year-old	275 lb. butter-fat.
Junior, 4-year-old	300 lb. butter-fat.
Senior, 4-year-old	325 lb. butter-fat.
Mature cows	350 lb. butter-fat.

A junior animal in each class shall be one which is 2, 3, or 4 years of age or over on day of calving, but under such years, plus six months.

A senior animal in each class shall be one which is 2½, 3½, or 4½ years of age, or over on day of calving, but under such age, plus six months.

8. If a cow aborts her calf during a lactation period, she shall be withdrawn from the test.

9. Further minor agreements were reached regarding exemptions from testing on account of sickness, injury, &c., disqualifications, fees, averaging normal tests, supervision, &c.

10. That all cows in the herd shall be tested annually unless exempted by the Minister on written application from the owner, stating exceptional circumstances, and endorsed by the Director of Agriculture, but in no case shall more than 50 per cent. of females in lactation be so exempted; further, that all cows must be tested at least once before reaching four (4) years, and at least once again before reaching eight (8) years.

11. The yield for the official record period shall be calculated as follows:—

The lactation period shall consist, in the case of the 273 days' records, of nine (9) sub-periods, covering respectively eight (8) sub-periods of 30 days and one of 33 days, and, in the case of the 365 days' record, of eleven sub-periods of 30 days and one of 35 days.

The cows shall be tested once in each sub-period at approximately equal intervals of time.

The official yield shall be the sum of the yields in each sub-period.

The yield for each sub-period shall be calculated as follows:—

The record shall be the milk yielded over 24 hours, multiplied by the length of the sub-period.

The butter-fat yield shall be the amount of butter-fat calculated by test of the 24 hours' milk yield, multiplied by the length of period.

12. That the testing officer shall see that all cows are milked out under his supervision at the milking prior to the official 24 hours' test commencing.

13. That the feeding of whole milk or cream to cows undergoing test be prohibited as being a wasteful practice.

14. (*a*) Testing shall be done by qualified officers appointed by the Department of Agriculture.

(*b*) The districts of testing officers shall be changed as often as possible.

(*c*) It shall be optional to either test on the farm or centrally.

RULES FOR OFFICIAL TESTING OF PURE BRED DAIRY CATTLE BY THE VICTORIAN DEPARTMENT OF AGRICULTURE.

(Issued by Authority of the Hon. the Minister for Agriculture and based on the Resolutions Adopted by the State Ministers for Agriculture in Conference at Melbourne, May, 1923.)

General.

1. This testing scheme shall be known as the Government Official Pure Bred Dairy Cattle Testing Scheme.

2. (*a*) The owner of any herd of pure bred cattle may apply for entry of his herd and shall pay the prescribed fee therefor.

(*b*) All pure bred cows owned by an entrant to the test must be tested with such exception as set forth in Rule 17.

(*c*) Only those cows will be accepted for test which are registered or have been accepted for registration in a recognized Herd Book or Pure Stock Register.

(*d*) When a breeder owns more than one herd on separate farms, each herd shall be considered and recorded as a separate herd. Any cow commencing her record on one farm shall be credited to the herd on that property though she may complete her record on another property of the same owner. In the event of a cow being sold during her record period, the record shall be transferred to the purchaser.

(*e*) Any cow entered for the test and any calf, the progeny of such cow, must be branded to the satisfaction of the officer controlling the scheme, in such manner as to ensure identification.

(*f*) Any cow which, on examination, is found to be affected with tuberculosis or actinomycosis of the udder or any other disease or condition which may render her milk injurious, may remain in the herd for testing, but her milk shall not be used for sale nor for the preparation of any dairy produce for sale without permission.

Fees for Testing.

3. Each herd owner shall pay to the Department of Agriculture, on entry of his herd, and annually thereafter, a herd entry fee of £2, together with a fee of 10s., repayable at each lactation period, for each cow submitted to test. Provided that, in respect of a herd owned solely by a returned soldier and being his bona fide property, the fees chargeable shall, during the first five years the herd is under test, and no longer, be one half the amounts above specified; that is a herd entry fee of £1 payable on entry and annually thereafter, and a fee of 5s. per cow, payable on entry and repayable at each lactation.

Period of Official Test.

4. (*a*) The official lactation period shall occupy 273 days, which may be extended to 365 days on the request of the owner. Such request must be submitted to the officer in control not later than one month prior to the expiration of the 273 days period.

(*b*) The official lactation period shall commence Five clear days after calving. The first five days' yields after calving shall not be included in the testing period.

Computing Official Records.

5. The yield for the official lactation period shall be calculated as follows:—

(*a*) The lactation period shall consist in the case of the 273 days' record of nine (9) sub-periods, covering respectively eight (8) sub-periods of 30 days and one (1) of 33 days; in the case of the 365 days' record, of eleven (11) sub-periods of 30 days and one (1) of 35 days, except in case of cows not completing the full sub-period, in which case the lactation shall conclude with a sub-period of the completed days.

(*b*) The cows shall be tested once in each sub-period at approximately equal intervals of time.

(*c*) The official yield shall be the sum of the yields of each sub-period.

(*d*) The yield for each sub-period shall be calculated as follows:—

The milk-yield shall be that of the official check-day multiplied by the length of the sub-period.

The butter fat yield shall be the amount of butter fat calculated by test of the same 24 hours' milk yield multiplied by the length of the sub-period.

(*e*) All cows as far as possible should be tested within the last week of their official lactation period. Cows that are tested for first sub-period within 15 days after calving must be submitted to ten (10) tests in the case of the 273 days' official period and 13 tests in the case of the 365 days' period in place of 9 and 12 tests respectively. The 9th and 10th tests and 12th and 13th tests to be averaged.

6. The tests shall be carried out as far as possible at intervals of 30 days (*vide* rule 5*b*). In the event of it not being possible so to do the tests may be taken not more than 35 days nor less than 25 days after the preceding test; and if this is not practicable, the calculations for the period under test shall be averaged as in the case of an abnormal test (*vide* rule 7), except that, in addition to the tests of the preceding and succeeding months, the weights and tests of the sub-period under review when taken will also be included in making the average.

Additional visits may be made for the purpose of taking supplementary samples at any time.

Averaging Abnormal Tests.

7. In cases of cows appearing to be sick or testing abnormally, i.e., more than 25 per cent. above or below normal milk and fat yield, at the time of the Tester's visit, such tests shall not be registered, but an average made from the proximate and succeeding tests. Any such sickness shall be reported to the Department by the official Tester. Where the first test is abnormal it shall be discarded and the yield for the first sub-period shall be calculated on the average test of the next two periods.

Where First Test is Taken Two Months After Calving.

8. Where owners are commencing to test their herds for the first time or where it has been found impracticable to test certain cows until after they have been calved for a period of two months or more the Department may on the receipt of a statutory declaration from the owner or other acceptable proof as to the date of calving credit these cows' yields with 60 days' production, based on the first 24 hours' test made by the official Tester.

Who Shall Be Official Testers.

9. (*a*) The official testing of cows shall be carried out by qualified officers appointed by the Department of Agriculture. In districts in which testing is carried out on the farm, the officers shall be changed as often as possible.

Where Testing Shall Be Carried Out.

9. (*b*) It shall be at the option of the Department to test either on the farm or send the samples under adequate protection to be tested at some approved centre; i.e., the Government Analyst's Laboratory.

Official Supervision.

10. The owner must state at the time of entry, or at the request of the testing officer, the hours at which he intends to start his milkings. These times are then to be regarded as his scheduled milking-hours, and must not be departed from without three days' preliminary notice to the Chief Veterinary Inspector. The testing officer has the right to see that all cows are milked out under his supervision at the milking prior to the official 24 hours' test commencing.

Daily Weighing and Recording.

11. The owner undertakes that the milk of each cow under test shall be weighed on officially approved scales, and recorded, at each milking, on a chart provided by the Department of Agriculture, except on checking days, when the weighing and recording shall be done by the official tester. After thoroughly mixing such milk the official shall take a sample for the official test. The milk from each milking shall be recorded and tested as separate units and the composite test computed therefrom. No milk weight shall be credited to any cow unless the aggregate of all milkings in the 24 hours totals 4 lb. or over.

Number of Milkings per Day.

12. No cow shall be milked more than twice a day unless she is yielding more than 60 lb. of milk per day, or unless the special consent, in writing, of the Senior Herd Tester has been obtained. In such circumstances, milking three times a day is permitted until such time as the yield falls to 50 lb. per day, when twice-a-day milking must be resorted to.

Accommodation of Testers.

13. Every facility is to be afforded by the herd owner to Testers in carrying out their duties in connexion with the scheme and accommodation provided overnight if necessary.

Particulars of Date of Calving, Etc.

14. (*a*) Owners must supply on the request of the Department particulars as to the date of calving and services, manner of feeding and details as to the class, quantity, &c., or any other details regarding the rations fed during the period of the test and when deemed advisable by the Department shall allow samples of the different foods supplied to be taken for analysis.

(*b*) All particulars required by the Department shall be made by sworn declaration when deemed necessary.

Issue of Records and Certificates.

15. (*a*) A Government Certificate will be issued in respect of every cow which attains the standard and such Certificate shall include particulars as to breed, age, brands and marks including the official marks, the length of testing period, date of completion of test and the yield in

milk and butter fat and the weight of milk on the day of the last official test.

(*b*) A certificate issued in respect of any cow shall if she attains the standard at any subsequent lactation period be returned to the Department for endorsement thereon of the result of each successive lactation period.

(*c*) All calculations shall be made, recorded and published in terms of pounds of milk and butter-fat only.

(*d*) Records of all cows submitted to the test shall be published including those that fail to reach the official standard.

16. The standards upon which certificates shall be issued are as follows:—

Junior 2 year old	..	200 lb. butter fat
Senior 2 ,, ,,	..	225 ,, ,, ,,
Junior 3 ,, ,,	..	250 ,, ,, ,,
Senior 3 ,, ,,	..	275 ,, ,, ,,
Junior 4 ,, ,,	..	300 ,, ,, ,,
Senior 4 ,, ,,	..	325 ,, ,, ,,
Mature cows ..	..	350 ,, ,, ,,

Junior animal in each class shall be one which is 2, 3, or 4 years of age, or over, on day of calving, but under such age, plus 6 months.

Senior animal in each class shall be one which is $2\frac{1}{2}$, $3\frac{1}{2}$ or $4\frac{1}{2}$ years of age, or over on day of calving, but under such age, plus 6 months.

All standard cows shall be so branded or marked, as to be identifiable, with the certificate issued.

Exemptions.

17. (*a*) On a written application from the owner stating exceptional circumstances and endorsed by the Director of Agriculture, the Minister may exempt any number of cows not exceeding 50 per cent. from the test, provided that all cows must be tested at least once before reaching four (4) years of age, and at least once again before reaching eight (8) years of age.

(*b*) Any cow that aborts her calf during a lactation period shall forthwith be withdrawn from the test.

(*c*) Exemptions from the test may be granted in respect of cows which come within the following category:—

Cows over ten (10) years of age or those that are sick, diseased or injured in such a manner as in the opinion of the officer in control to seriously impair such cows' capacity for milk production.

Feeding Milk or Cream to Cows.

18. The feeding of whole milk or cream to cows undergoing test is prohibited as being a wasteful practice. Any records obtained from cows so fed will be disallowed.

Disqualifications.

19. Should the owner of any herd entered for testing not conform to these regulations such herd shall be subject to disqualification for such period as the Minister may determine.

EXPERIMENTS IN COOL STORAGE OF FRUIT.*

By D. B. Adam, B.Ag.Sc., and J. E. Harrison, B.Ag.Sc.

Pears.

William Bon Chretien.

One consignment of these pears was sent by Mr. A. Thomson, of Merrigum, on the 18th February, 1924, and another consignment on the 25th February, 1924. The fruit of the first consignment was not so mature or so large as the fruit of the second consignment, which was in a condition ready for market, being fully grown but still hard and green. Each consignment consisted of three trays, and on arrival at the Government Cool Stores one tray of each was stored at 32°, one at 34°, and one at 37° F.

On the following dates, a row of fruit was removed from each tray, allowed to ripen at room temperatures, and afterwards examined, with the following results:—

Date of Removal.	Storage Temperature.	Remarks.	
		8th February, 1924.	25th February, 1924.
9th April ..	32	Colour good, flavour good	Colour good, flavour good
	34	Colour good, flavour good, one with skin turning brown	Colour good, flavour good
	37	Colour good, flesh slightly mealy, one with skin turning brown	Colour good, flesh slightly mealy, one with skin turning brown
23rd April ..	32	Fruit wilting, colour good, flavour fair, being slightly tart	Colour good, taste good, but slightly hard, no wilting
	34	Fruit wilting, colour good, flavour fair, being slightly tart	Colour good, flavour fair, no wilting
	37	Fruit wilting, flavour fair, being dry, not mellow and sweet, two with skin turning brown, one with small mould	Four with skin turning brown (seed of these white), one sound, colour good, flavour good (seed of this pear brown)
9th May ..	32	Colour good, flesh hard, taste not mellow	Colour good, taste good
	34	Four with skin turning brown, one with colour good, taste fair, flesh dry	Colour good, taste good
	37	All fruit had turned brown	All fruit had turned brown
28th May ..	32	Colour good, taste fair, flesh dry	Colour and taste good
	34	All fruit had turned brown	Three fruit had turned brown, two sound, colour and taste good
29th July ..	32	Fruit wilted, none marketable owing to browning and mould	Six sound pears, two with skin turning brown

On the 28th May (fourteen to fifteen weeks after first storing) the examination included a count of the total fruit in the trays at 32° and

* This report has been in type for a considerable time, but space could not be found for it at an earlier date.

34° F. respectively. At 32° there was no browning of the skin in either of the lots picked on the different dates, while at 34°, in the lot picked on the 18th February, 1924, there were twelve pears with browning of the skin and six sound pears, and in the lot picked on the 25th February there were only two pears with browning of the skin, fifteen sound pears and one pear with mould.

A survey of the above results for each consignment at the three different temperatures recommends the later picking and the lowest temperatures as factors enhancing the keeping quality of the Williams pear in cool storage. Fruit picked early commenced to show wilting after nine to ten weeks in cold storage, and at the lower temperatures evinced a more rapid development of browning of the skin than fruit picked later. Its flavour throughout was only fair, tending to be tart and dry, and its texture was rather hard and woody—not soft and mellow as is desirable in an eating pear. A temperature of 32° preserved both lots of fruit for thirteen to fourteen weeks, when browning of the skin and mould developed, particularly in the fruit picked early.

At 34° both lots were in good order after nine to ten weeks, and after eleven to twelve weeks the fruit picked late was still sound, but that picked early had commenced to turn brown, while at 37° both lots were maintained sound for seven to eight weeks only, browning and mould appearing upon examination after nine to ten weeks in storage.

Plums.

Wickson.

Several trays of this variety were received on the 2nd February, 1924, and stored at temperatures of 32°, 34°, and 37° F. The fruit, however, had been delayed in transit, and was in a rather forward condition when stored. On the 14th March a few plums from each tray were taken out and examined, and in no instance was a satisfactory result obtained, the fruit at each temperature having developed mould, and a browning of the flesh taken place around the stone.

Fellenberg.

On the 20th February a case of these plums was stored at 34° F.; on the 1st April a few plums were removed for examination, and after five days were found to be in excellent order, both as to colour and flavour. The interval between the above dates, during which the fruit held up well, was about six weeks. A later examination on the 23rd April revealed the development of mould in the case, the browning of the flesh of a portion of the fruit, and a falling off in flavour. Evidently the first period of six weeks encompassed the length of life of the sample used.

President.

A case of President plums, received on the 20th February, was stored alongside the Fellenberg plums at 34° F., and examined on the same dates, with much better results, the second examination on the 23rd April (nine weeks' storage) showing the plums to be sound and in good condition, the flavour being fresh and natural. After three months, however, the fruit commenced to show storage deterioration; but of the three varieties tested, the President easily led as the most successful in cool storage.

Grapes.

Some experiments were instituted during the season to investigate questions as to temperature and maturity arising in connexion with the cool storage of grapes, and a synopsis is given in the following article of the various experiments made and the results obtained. Recommendations based on these results are offered, and it is hoped to pursue our investigations further this year.

In all the experiments, only grapes packed in cork-dust in flat bushel cases were used.

The assistance of Mr. F. de Castella, Viticultural Expert, was obtained for all examinations of the fruit, and his opinion on its condition and commercial value accepted.

On the 11th April, a case of grapes containing the three varieties, Olivette blanc, Servan blanc, and Gros Guillaume, was forwarded by Macknight Bros., of Rutherglen, and stored on arrival at 34° F. On the 30th July (sixteen weeks later), an examination gave the following result:—

Olivette blanc.—Fruit hanging well to stalks, firm, a few berries mouldy.

Servan blanc.—Fruit softer, more berries mouldy.

Gros Guillaume.—A mouldy mass, only a few berries good.

A number of varieties of grapes were received in April from the Viticultural Experimental Station, Rutherglen, and stored together in a chamber maintained at 34° by an air circulation system. An examination was made on the 30th July, with the following result:—

Ohanez.—In excellent condition.

Emperor.—Some mould, wilting in riper grapes, good fruit, excellent flavour.

Purple Cornichon.—Fair order, some mould, berries fall easily.

Red Prince.—Mouldy, a few good berries, flavour good.

Amokrane, Black Alacante, Formosa, Gordo Blanco, and Valensy.—All mouldy.

Barbarossa and White Martello.—Very mouldy.

Ohanez from different growers in different districts were stored at various temperatures, and gave uniformly good results, the Ohanez establishing itself again in all varietal tests as the best keeper in cool storage.

One lot of nine cases sent from Merbein on the 16th April was stored at various temperatures under various systems of refrigeration. The fruit was selected fruit, from a stiff soil which had not been watered since February.

On the 30th July (after fifteen weeks' storage), a general inspection was made of the fruit in the various chambers, and the following observations were recorded:—

At 32° there was less mould than at any higher temperature, the patches of mould growing in wads or tufts at 32°, while tending to spread at higher temperatures. There was not always less mould at 34° than at higher temperatures, though most mould was formed in a case stored at 37° in a direct expansion chamber. A case, however, stored at 42° in a chamber cooled by air circulation showed only slight development of mould, and compared very favorably with fruit stored at 34° under the same system.

At 42° in circulating air, wilting of the fruit occurred to some extent, and drying of the stalks, two features which would militate against the development of mould. A noticeable feature in fruit stored at 32° and 34° was the maintenance of the stalks in a moist green state, and the consequent growth of mould on them.

At 34° and below, the fruit, after a little trimming off of odd berries, was in a marketable condition, as was the fruit stored at higher temperatures under the air circulation system of refrigeration.

At all temperatures, the maturity of the fruit appeared to be a factor in determining its length of life in cool storage, the riper fruit losing its brightness of colour, and succumbing first to the attacks of mould. The best stage of maturity for storage appeared to be when the fruit was fully grown and sweet to the taste, but still green in colour and firm in the flesh, and not showing any yellowing of the skin. Bunches of this type maintained a bright healthy appearance, where riper bunches were of a dull leaden colour. Compact bunches in which the berries were studded closely together suffered more from the attacks of mould than open bunches, and also cases in which cork-dust had been scantily used developed more mould than those which had been given a liberal filling of cork-dust.

On the 2nd May, six cases of Ohanez were received from a Merbein grower. Four of these had been picked on the 15th April and held over, and two cases on the 29th April. One case of each lot was stored at 32° and 37° respectively, and examined at the end of July. Both cases at the lower temperature turned out in fair condition; the stalks, however, were soft and mouldy, while at the higher temperature there was a greater development of mould in the berries. Any choice between the lots was in favour of the fruit picked on the 29th April and stored without delay, and a subsequent inspection made some weeks later confirmed this preference, the fruit at 32°, picked on the 29th April, being superior in all respects, though in itself only in fair condition. The two remaining cases of the lot picked on the 15th April, 1924, had been stored at 34° F., one case in a chamber cooled by air circulation, and the other in a chamber cooled by direct expansion. There was no decided difference between these two cases, and neither turned out so well as the case above mentioned, picked on the 29th April, and stored at 32°.

In view of the above various results, the following recommendations for the storage of Ohanez grapes seem pertinent:—

Picking for storage should take place when the fruit is fully grown and sweet, but still green in colour and firm in the flesh.

Dense bunches of grapes are more susceptible to mould than open bunches, and should be avoided in storage.

A liberal filling of cork-dust should be used in packing.

Fruit should be stored without delay after picking.

A temperature of 32° should be maintained as the best storage temperature.

It is pointed out that although good results were obtained experimentally at 42° F. in a chamber cooled by circulating air, the case itself was single and isolated, and free from the contact of other cases on all sides, and that in a commercial chamber, where stacking of the cases is necessary and the same degree of circulation impracticable, equally good results could not confidently be expected on a large scale at this temperature.

POULTRY REARING ON THE FARM.

By W. C. Rugg, Chief Poultry Expert.

Last year the estimated value of poultry and eggs produced in the Commonwealth was £9,846,014.

Of this amount Victoria produced over 46 per cent., New South Wales 32 per cent., South Australia 12 per cent., Queensland a little over 4 per cent., Tasmania 3 per cent., and Western Australia 1 per cent.

Victoria leads all the other States in this very important industry, probably because she has an ideal climate for the production of every kind of food necessary for the best development of all kinds of poultry.

Poultry can be made a profitable adjunct to any farm, provided that the birds are comfortably housed and properly fed; but it is well nigh impossible for any one to make a financial success from poultry production without a personal liking for the work.

There is an ever-increasing demand for a better quality of eggs and poultry in Victoria. With the opening up of the export trade in eggs this year to London, there are unlimited possibilities in this branch of farming.

The raising of poultry for both meat and eggs is essentially a farm enterprise, and may be most profitably conducted as part of the general farming operations. Unfortunately, a great many farmers look upon poultry as too insignificant for their attention, yet no other farm crop pays so well for the capital invested.

Many farmers' flocks are unprofitable because of the lack of a definite system of breeding, with the result that constitution and vitality are lowered, which means loss of size in the table birds and lower egg production from the laying breeds. Why this should be so it is hard to understand, as many farmers throughout Victoria are very much alive to the necessity of using pedigreed bulls for the production of their best milking cows; yet some of these same farmers seem to think that any old pair of birds will breed profitable pullets.

The sooner these farmers realize that high egg production is bred into fowls as surely as high butter-fat production is bred into cows, the better it will be both for themselves and Victoria.

A leading authority once said—"It is the duty of every one of us who have the development of this country at heart to encourage the greatest possible production of every article of food that can be produced with profit."

The production of eggs is one that should be seriously undertaken by the farmers of Victoria.

Australians generally seem to think that England wants only our wool and wheat; but she is prepared to buy all the surplus eggs of size and quality we can produce.

England imported last year £20,000,000 worth of eggs. Nearly the whole of this huge sum she paid to foreign countries. Less than a quarter of a million was paid to her own Dominions.

Here is a chance for the Victorian farmer to help develop an industry that will not only benefit himself, but will also help Victoria in her effort to bring the value of her exports a little nearer to that of her imports, and so benefit the whole community.

A flock of 200 or 300 hens can be kept without interfering with other farm operations, and with very little additional time and expense.

I do not believe there is any best breed or variety suitable for all purposes. It is an accepted fact, however, that pure breeds pay better than cross-breds.

The advantages of pure breeds are—better appearance on the farm, higher production of eggs, and more uniformity when sold for table purposes.

Improvement in farm flocks can be easily attained by keeping the breeds pure; by breeding only from second and third-season hens of good shape, size, and production; by using only pedigree males; and by hatching only from eggs weighing not less than 2 ounces.

It is an accepted fact amongst breeders that high egg production is transmitted from a hen through her son to his daughters, just as surely as high butter-fat production is transmitted through a bull to his heifers.

Better results in egg production have been obtained with a pedigree male and poor laying females than where the hens have big records and the male does not carry the fecund quality.

A couple of guineas is well spent on a good pedigreed male bird, considering that he may be the father of 70 or 80 pullets in a season; and, if through his use the egg production is increased by only one dozen eggs per bird per annum, on the average price of eggs last year, which was 1s. 9d. per dozen, this would mean an increased income of £6 to £7.

Pullets intended for egg production should be hatched during the months of July, August, and September; chickens hatched after that are slow to develop, and are usually unprofitable.

My experience is that autumn hatching for egg production is wrong. Stock do not make satisfactory growth, and the pullets usually lay small eggs.

To get the best results, pullets must be well fed on good pure meals and clean grains; variety is absolutely necessary, and a good supply of succulent green stuff every day is essential.

Experimental feed tests carried out at the Research Farm at Werribee show that improved egg production can be obtained by feeding green stuff after the grain feed at night in addition to that given in the middle of the day.

Hens will not show profitable results if fed only on bran, pollard, and wheat, because this diet becomes monotonous, and they will soon tire of it, and after a short time will eat only sufficient to satisfy their hunger, and not the extra amount necessary to enable them to lay a profitable number of eggs.

Variety in feeding can be obtained by mixing the morning mash of bran and pollard with soup made from boiled livers, sheep's heads, rabbits, or separated milk.

The grain feed can be varied by mixing Algerian oats, maize, and barley with the wheat.

Some of the settlers on irrigation blocks allow the milk from the separators to curdle, and feed it to the birds either by itself or mixed in the mash, and they claim to get better results from their birds than can be got by giving the milk in any other way.

In conclusion, a few don'ts—

Don't breed from undersized birds;

Don't breed from any bird that has ever been sick;

Don't breed from any hen that lays an egg less than 2 oz. in weight;

Don't buy birds from a breeder unless he will guarantee they are bred from stock that laid eggs weighing at least 2 oz.;

Don't forget that the Department of Agriculture runs a poultry section at Werribee expressly to get information for you. Why not make use of it?

THE PEAR ROOT APHIS.

(*Eriosoma pyricola*).

By C. French, jun., Government Entomologist and G. T. Levick, B.Agr.Sc., Science Field Officer.

During the last four or five years an aphis on the roots of the pear trees, hitherto unknown in this country, has occasioned orchardists and nurserymen some anxiety, and occasionally serious loss.

This aphis has been identified by the Bureau of Entomology, Washington, as the Pear Root Aphis, *Eriosoma pyricola*, closely allied to the Woolly Aphis, or American Blight, of the apple (*Eriosoma lanigerum*). In fact, it was for some time considered identical, but closer observation proved that the Pear Root Aphis is quite distinct, the immunity of apple seedlings planted close to infested pears being absolute.

While this pest is comparatively new here, it has been known for nearly a quarter of a century in California, and occurs over practically all the northern and central sections of that State, in some regions proving most destructive. Unlike the Woolly Apple Aphis, the Pear Root Aphis appears to work entirely underground, and though in America it has been found to pass one stage of its life-history on the elm, where it is very similar in its manifestations to the Elm Aphis (*Eriosoma lanuginosum*), as far as is known at present in this country it passes the whole of its life-history on the roots of the pear.

The loss occasioned by the Pear Root Aphis is greatest when it invades the nurseries, the pear stocks often dying in large numbers from its attack. In the case of larger trees the effect at first is such as would be expected to follow the loss of sap, i.e., growth is stunted, and the fruit small and inclined to drop off. A fungus sometimes follows the ravages of the aphis, and if the tree is inclined to be weakly it may succumb to the attack. Infestation is usually heavier on the rootlets close to the trunk, but the aphis may frequently be found in large numbers as far as the roots extend.

Soil fumigants seem to offer the most promising remedy for the Pear Root Aphis, and some of these have given fair results in America. During the past year the Science Branch of the Agricultural Department, in conjunction with Mr. Pilloud, District Orchard Supervisor, has tried many fumigants and other soil treatments, with differing degrees of success. At Garfield, Clift's manurial insecticide, potassium sulpho-carbonate, and paradichlorobenzine were used, and as the latter gave indications of a promising nature, further experiments were carried out, the quantities of material used being varied.

The affected trees in these experiments were large and well grown, of various varieties which had become unthrifty, and bore small crops of undersized fruit during the previous season or two. On digging beneath the trees, almost every rootlet was found to be covered with the

woolly secretion of the aphis, and large numbers of the insects could be seen.

As little as 2½ ounces of paradichlorobenzine (hereinafter spoken of as P.D.B.) scattered on the surface of the soil and dug in, or placed in a hole about 6 inches deep excavated round the tree, seemed very effective in killing the aphis, for when investigations were made about three months after treatment the fumes of the P.D.B. still hung about the soil, and no live aphids could be seen. On some trees much larger quantities of the chemical were used (up to 20 oz.), and while all the aphis appeared to be dead, as far as can be seen up to the present the trees suffered no ill effects from the fumigant.

The other chemicals tried in this experiment gave varying results, but none of them proved as efficacious as the P.D.B., though much larger quantities were used.

At Mooroopna further experiments were carried out in the treatment of young trees, two-year-old stock being selected. Two acres of these were badly infested, and some twenty trees were selected for experiment.

Nos. 1-5 were treated with 1 oz. of P.D.B. per tree, scattered over the surface of the soil 6 inches from the tree, and spread over an area of about 1 square yard, then dug under to a depth of about 6 inches.

Nos. 6-10 were treated in a manner similar to the above, but 1 oz. of calcium cyanide dust similar to that used in fumigating citrus was the chemical used.

Nos. 11-15 were left as checks.

Nos. 16-20 were treated with red oil. This was made up as for spraying at a strength of 1 part of oil in 15 of water. Three-quarters of a gallon of the mixture was then poured into a trench dug round the tree about 1 foot from the trunk.

On removing one of each of these trees for examination about a month later, no aphis could be found on any of the treated trees, while those left as checks were infested, though the root system of those to which the oil and the cyanide had been applied seemed to be affected by the treatment. However, the trees treated with cyanide appear to have broken away in a normal manner this season, though in the case of the trees on which the oil experiments were carried out, shooting was apparently somewhat delayed.

It should be noted that all these experiments were carried out during the dormant period, when the chances of injuring the trees were smallest.

While the experiments indicate that the treatment of the Pear Root Aphis on these lines may lead to very beneficial results, still no definite recommendations can be made in this regard until a longer period has elapsed, and more experiments are carried out under varying conditions of soil and climate.

At the present time, then, the best line of treatment is good cultivation and liberal application of manures, especially superphosphate and potash, to enable the trees to withstand the drain on their strength through the attack of the aphis. All young stock should be dipped before planting in either of the following solutions:—Nicotine sulphate or black leaf 40—1 lb. in 80 gallons with 3 lb. of soap; or miscible spraying oil, 1 gallon to 40 gallons of water. This is in addition to the dipping they should get before being sent out from the nursery, which our experience tends to show is not always as effective as might be desired.

A PROFITABLE HEIFER.

By G. E. York, Dairy Supervisor.

The increasingly high cost of production makes it absolutely necessary that the dairy farmer who would be successful must obtain the maximum amount of butter-fat with the minimum amount of labour, hence the necessity of fewer and better cows, and better fed cows.

The following record, showing the cost of feeding of the Jersey heifer, Harebell of Springhurst, a junior 2-year-old in the 1924-5 Standard Herd Test, furnishes convincing evidence of the fact that, though a variety of foods is, as a rule, beneficial, and may even be essential where a fastidious feeder is found in the herd, a high record may be

Harebell of Springhurst.

obtained by the use of only the more easily procured and less expensive foods, namely, oaten chaff, bran, and crushed oats.

The quantities set out below may seem small to the reader, but it must be noted that the cow was grazing on good pasture land throughout the test, and also that she belongs to a small breed, requiring less for bodily upkeep than would be the case with a larger animal.

Harebell is owned by Messrs. D. Cameron and Sons, of "Studleigh," Valencia Creek. The portion of the property utilized for dairying comprises about 107 acres of rich river flat, along the Valencia Creek, near its confluence with the Avon River. Her record for the nine months she was under test is as follows:—

Milk—7,851 lb.
Average test—5.95.
Butter-fat—466.71 lb.

The table below shows the quantity of feed, and its value, fed to her during the period of test.

Variety.	Quantity.	Cost.	Total Value.
	lb.		£ s. d.
Oaten Chaff	2,184	£5 per ton ..	4 17 6
Bran	1,365	£6 10s. per ton ..	4 8 8
Crushed Oats	180	3s. 3d. per bushel	0 14 8
Grazing for 39 weeks	—	Say, 2s. per week	3 18 0
	Total cost of feed ..		£13 18 10

	£ s. d.
Value of 466.71 lb. of butter-fat at 1s. 6d. per lb. ..	35 0 0
Value of 705.5* gallons skim milk at 2d. per gallon ..	5 17 9
Total value of yield for nine months	40 17 9
Cost of feeding	13 18 10
Balance over cost of feeding	26 18 11

Harebell completed her test of 273 days on the 23rd May last with a yield of milk on the last day of 14½ lb. She was in the pink of condition, and due to calve again in less than eight weeks, thus proving that even a growing heifer can make a big record, and supply the needs of a growing foetus, without losing condition, by drawing on the tissues of her own body.

This can only be accomplished when the amount of nutrients required for milk production and for bodily maintenance each day is replaced by the daily ration.

* The quantity of skim milk was arrived at by assuming that one-tenth of the total yield represented cream.

THE SOURCE OF FLUKE DISEASE IN SHEEP AND OXEN.

F. G. Cawston, M.D. (South Africa).

It is surprising that no one has recorded any intermediate host for either the Bilharzia parasite, or for the liver flukes in the Commonwealth, since Major T. Cherry reported the results of his investigations as to whether Bilharzia disease was likely to become widespread in Australia. Although Bilharzia disease is known to exist in Mauritius, we are still ignorant of the freshwater snail which acts as the intermediate host in the island. The intermediate host for the Bilharzia parasites in South Africa is *Physopsis africana* Krauss; in Portuguese East Africa it is *Isidora globosa* Morelet. Probably a closely-allied species of the *Limnaeidae* acts as the carrier in Mauritius and Madagascar.

By the aid of the microscope one can readily distinguish the teeth of *Physa* from those of *Isidora* which, otherwise, might be mistaken for the former. It was largely by examining the teeth of the Australian species of *Bulinus* that Cooke succeeded in showing that it was not *Physa*, as had been supposed. So far as is known, *Physa* is never responsible for the spread of either Bilharzia disease or the liver flukes; so that the determination of the genera of our fresh-water snails is of real

practical importance. In South Africa, south of the Zambesi, *Physa* is practically unknown. However, it occurs in Mauritus, where *Isidora* is unknown; for what had been reported as an *Isidora* proves to be a true *Physa*.

A microscopic examination of the teeth of fresh-water snails assists in determining the species, or at any rate the genera to which they belong. The teeth are attached to a ribbon-like structure, called the "radula." Although the narrow radulae of some lagoon and land molluscs that I have examined possess an equal number of teeth in each of their numerous rows; yet such is far from being the case in those fresh-water inhabitants of our rivers and pools which possess much broader radulae, so that a much larger area of food surface is covered by their teeth. The young examples of the various species have relatively large radulae to provide for the more rapid assimilation of food. Even the youngest example of our pond-snails possesses a total of about 500 separate teeth; whilst a fully mature example possesses from 7,000 to 10,000. I have been able to separate the individual teeth from the embryonic radula, and to identify the central, lateral, and marginal teeth even before the animal has hatched out of its shell.

In 1910, Dr. J. D. F. Gilchrist reported that he had found examples of *Physa tropica* infested with the typical stages of the liver fluke; but he noted that the observation lacked experimental proof. The infested examples were collected from the Muizenberg Lake, near Cape Town, and I have recently had the opportunity of visiting this lake, and making a careful examination of the shells concerned as well as of their teeth. Although there are minute differences in the appearance of the shell and of the teeth from those typical of *Isidora tropica* (Krauss), there is little doubt that the examples belong to this very variable species of fresh-water snail, and the teeth are typical of *Isidora*. In the same agricultural journal, Dr. Gilchrist referred to the fact that, from the investigations of T. Cherry, it would appear that *Bulinus tenuistriatus* might convey fluke infection in Australia. Here, again, however, experimental proof is lacking.

For a long time *Limnaea truncatula* Drap, a rare species which I have found in the Transvaal, was considered as being the likely carrier of fluke disease in South Africa, as it has been shown to be in Europe. Other species of *Limnaea* have also been shown to carry the infection in America. However, in view of the extent of fluke disease in South Africa, it seemed much more likely that the infection was conveyed by one of the commoner species of fresh-water snail, and, in 1919, by experimental methods, it was shown that *Limnaea natalensis* Krauss was the common intermediate host of fluke disease in Natal. This species is common all over the union, and especially in those localities where fluke disease is common amongst both oxen and sheep. It is most probable that a similar species is responsible for the spread of fluke disease in the Commonwealth of Australia. The importance of recognizing the real host for the parasite lies in the fact that some species, like the carrier of Bilharzia disease in the far East, for instance, possess shells which are particularly adapted for the resistance of drought, whilst the usual carriers of fluke disease and Bilharzia infection are readily destroyed by complete drying, by the introduction of domesticated duck on to farms, by burning rushes over ground which becomes covered with pools in the rainy season, and by the extensive use of lime in the soil.

HELPING THE POULTRY INDUSTRY.

A BENEFIT CONFERRED AND AN APPRECIATION.

The Director of Agriculture (Dr. S. S. Cameron) has received the following letter from a grateful settler:—

In June, 1924, I wrote to you requesting a visit from the poultry expert to give me some advice on the farm. Well, that visit and a later one has made such a striking difference, that I am sure you will be interested in these figures, which I find very gratifying:—

	1923-4.		1924-5.
	£ s. d.		£ s. d.
July	21 2 0	.. ..	26 17 11
August	12 1 6	.. ..	14 13 9
September ..	7 4 11½	.. ..	28 13 4
October	5 8 1½	.. ..	29 17 11
November ..	4 19 11½	.. ..	22 18 11
December	6 10 4½	.. ..	22 2 1
January	14 1 6	.. ..	10 18 4
February	5 8 7	.. ..	31 6 9
March	7 0 10	.. ..	25 14 3
April	3 15 7	.. ..	22 17 2½
May	—	Loss of £4 6 0	25 15 10
June	7 9 2½	.. ..	26 19 1
Total	£95 2 7½	(less £4 6 0)	£288 15 4½

Showing a difference in twelve months of £197 18s. 9d.

Same number of birds and same number of young stock were raised.

Not only does this difference make it a profitable undertaking, but stimulates one to further activities, and gives that interest in a business which we know is so essential to success. Might I, while writing, express my hopes that the sale of stud birds will not be stopped at the experimental farm. Any one who has suffered as I, and I am sure there must be quite a number, will certainly hope so, too. I purchased two stud roosters from the breeder I thought to be the most reliable in the State, and who had supposedly the best of stock. One I had to burn a few weeks after he arrived, the other produced for me a lot of unprofitable rubbish. Last year I purchased a rooster from Werribee at much less than the price I paid for the previous-mentioned birds. That Werribee rooster has so proved himself that his sons are in every pen this year but one, and that is occupied by himself, and I intend to breed in as much of his blood as possible. I could not put a value on that bird. So you see how any one placed as I was is at the mercy of these various breeders, if it was not possible to purchase stock elsewhere. I do not wish to condemn every breeder in the State, but just give you my experience. And I can assure you that when I have stud stock for sale myself, competition with such farms as Werribee will tend to keep me up to standard, and a bit above.

STALLION REGISTER 1925-26,

under the "Horse Breeding Act 1919."

Registrations prior to 31st August, 1925.

PART I.

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
228	Abbey	A	Light ..	Smith, R. M. ..	Landsborough
658	Abbotsford II. ..	A	Draught ..	Watts, W. ..	Kamarooka
229	Abbot's Pride ..	A	,, ..	Gadd, W. H. ..	The Glen, via Wodonga
994	Abbot Again ..	4	,, ..	McLeod, M. ..	Condah Swamp
793	Admiral Howard	A	,, ..	Holland, W. G. ..	Warracknabeal
103	Admiral Speary ..	A	,, ..	Hill, C. ..	Lascelles
625	Admiral Sperry ..	A	,, ..	Mathieson, D. ..	Waitchie
89	,, ,, ..	A	,, ..	Duff, A. ..	Baringhup
71	Admiral Wood ..	A	Light ..	Hunter, A. G. ..	Seymour
624	Advance ..	A	Draught ..	Hahnel, C. F. ..	Timberoo South, via Walpeup
191	Aird Laddie ..	A	,, ..	Yeoman, Ed. ..	Echuca
68	Al Borak ..	A	Light ..	Bennett, L. ..	Robin Vale P.O
148	Albion	A	Draught ..	Oakes, Jas. ..	Nathalia
799	All Green ..	A	Thoro'bred	Biggar, R. ..	Waaia
626	All Style ..	A	Light ..	Mitchell, R. ..	Bendigo
695	Almont M. ..	A	,, ..	Minns, J. ..	Melton
808	Almore	3	Draught ..	McFarlane, C. S. B.	Hopetoun
149	Amanus ..	A	Thoro'bred	Young, A. and J. H.	Blackheath
411	Ambition II. (imp.)	A	,,	O'Keefe, J. ..	Shepparton
655	Angle Jack ..	A	Light ..	Hillas, C. F. ..	Tallangatta
448	Argyle	A	Pony ..	Trimble, R. ..	Rutherglen
424	Armadale's Elect..	3	Draught ..	Walsh, F. H. ..	Melton South
301	Ash Voyage ..	6	Light ..	Guthrie, Jas. ..	Shepparton
192	Athlete	A	Pony ..	Lane, J. ..	Club Hotel, Warragul
259	Attraction's Champion	A	Draught ..	Morley, W. ..	Red Hill, Rutherglen
731	Avondale ..	3	,, ..	Loosemore, A. R.	Ultima
550	Avon Lea ..	A	,, ..	Leitch, Jas. ..	Wodonga West
627	Axedale Prince ..	A	,, ..	McDonald, J. ..	Ultima
983	Balnakill ..	A	,, ..	Straube, E. ..	Warracknabeal P.B.
535	Ballyloo ..	4	Pony ..	Strickland, L. ..	Kanya P.O.
385	Banderlad ..	5	Thoro'bred	Stanislaus, H. L.	Walpeup
252	Bannockburn ..	A	Draught ..	Francis, G. W. ..	Lower Norton, via Horsham
549	Baritone ..	A	,, ..	Humphrey, R. ..	Cudgewa
281	Barney II. ..	A	Pony ..	Thomson, A. W.	Hamilton
449	Baron	A	Draught ..	Maguire, W. ..	Barwidgee Settlement, via Myrtleford
132	Baron ..	A	,, ..	Deacon, J. ..	Sheep Hills
398	,, Alexander..	A	,, ..	Goodier, B. ..	Geelong L.B.
350	,, Belligerent	3	,, ..	Merriman, S. ..	Nangiloc
814	,, Bombay ..	A	,, ..	Shiels Bros. ..	Youanmite P.O.
517	,, Brilliant ..	4	,, ..	Murphy, M. P. ..	Rupanyup
505	,, Carlyle ..	5	,, ..	Bagnell, P. ..	Mologa
965	,, Cedric ..	4	,, ..	Luckie, Geo. ..	Springhurst
308	,, Clover ..	5	,, ..	Lord, J. ..	Boigbeat

STALLION REGISTER, 1925-26—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
238	Baron Clyde ..	A	Draught ..	Cunningham Bros.	Bamawm
260	,, Crombie ..	A	,, ..	Charles, W. ..	Maldon
881	,, Dale ..	3	,, ..	Hancock, E. F. ..	Aubrey, via Warracknabeal
714	,, Douglas ..	2	,, ..	Dahlenburg, V. ..	Winiam East
386	,, Fashion ..	6	,, ..	Burns, J. ..	"Delaforce," Euroa
548	,, Fenwick ..	A	,, ..	Gardiner, W. ..	Waaia
160	,, Fenwick ..	A	,, ..	Wilson, H. C. ..	Raywood
261	,, Jock ..	A	,, ..	Lynch, M. ..	Hopetoun
450	,, Juno ..	A	,, ..	T. Wallbridge Pty. Ltd.	365 Flinders-street, Melbourne
547	,, Laddie ..	A	,, ..	McLennan, A. ..	Derrinal
803	,, Lee ..	5	,, ..	White, J. D. ..	Box 97, Minyip
768	,, McKie ..	A	,, ..	McDougall, J. A.	Katandra, via Cosgrove
230	,, McLeod ..	A	,, ..	Mitchell, David, Est.	Lilydale
802	,, Major ..	5	,, ..	Krelle and Henke	Boolite
387	,, May ..	A	,, ..	Oberin, H. W. ..	Goornong
718	,, Millsford II.	3	,, ..	Albert, H. E. ..	Natimuk
829	,, Minto ..	A	,, ..	Hermiston, W., exors.	Mansfield
964	,, Munro ..	3	,, ..	Luckie, G. ..	Springhurst
530	,, Newfield ..	3	,, ..	Martin, R. A. ..	Navarre P.O.
340	,, of Dalmore	A	,, ..	Henty, J. R. ..	Pakenham
504	,, Pettie ..	2	,, ..	Price, J. ..	Mologa
282	,, Prince ..	6	,, ..	Banko, R. P. ..	Timmie P.O., Koyuga
491	,, Regulus ..	4	,, ..	Dolman, J. A. ..	Neilborough
262	,, Silk ..	A	,, ..	Cameron, K. ..	Warracknabeal
159	,, Stanley ..	A	,, ..	Cantwell, P. F. ..	Tooronga, Mt. Egerton
370	,, Stewart ..	A	,, ..	Adams, H. M. ..	Yielima P. O.
239	,, Wattee ..	A	,, ..	Nagorcka, F. ..	Tarrington
122	,, Weerite ..	A	,, ..	Manifold and Lee	Purrumbete, Weerite
70	,, Wigton ..	A	,, ..	State Research Farm	Werribee
363	Baronet.. ..	3	,, ..	Fraser, W. ..	Watchem
512	Baron's Fancy ..	3	,, ..	Meyers, J. H. ..	Kaniva
167	,, Favourite	A	,, ..	Bodey, D. L. ..	Jung
518	,, Hero ..	4	,, ..	Allan, W. H. ..	Broughton
52	,, Idol ..	A	,, ..	Carmichael, J., jnr.	Mulwala P.O., N.S.W.
670	,, Pride ..	A	,, ..	Henderson, C. W.	Tinamba
276	,, Pride ..	A	,, ..	Quinn, J. J. ..	Elmore
394	,, Reserve ..	A	,, ..	Bartlett, T. G. ..	Gerang Gerung
168	,, Royal Chief	A	,, ..	Parry, T. E. ..	Coonover Bridge
231	,, Superior ..	A	,, ..	Bransgrove, W.	Neerim North
399	Basella	A	Thoro'bred	O'Halloran, R. ..	Granya
676	Basil B... ..	A	Light ..	Riedill, W. A. ..	Tongala
400	Battarlons ..	A	,, ..	Skelly, T., jnr. ..	St. Arnaud
391	Bawnmoor ..	A	Thoro'bred	Jessa Singh ..	Nyarrin
614	Bay Harold ..	A	Light ..	Sutherland, A. ..	10 Palmer-street, Oakleigh
696	Beaconsfield Flyer	A	,, ..	Cousins, P. ..	Gapsted P.O.
546	Beau Gallant ..	A	,, ..	Dunlop, T. ..	Birregurra
507	Bedouin ..	3	,, ..	Thomas, P. ..	Highbury-road, Burwood East

STALLION REGISTER, 1925–26—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
960	Belmain ..	A	Draught ..	Carroll, J. J. ..	Watchem
697	Belmont Again ..	A	,, ..	Creighton, W. A.	Alexandra
130	,, Print ..	4	,, ..	Tweddle, J. A. ..	Waaia
877	Belmont's Champion	A	,, ..	Scarce, H. ..	Melton
1003	Bell Boy ..	5	Pony ..	Lovell, O. O. ..	Drumborg, via Heywood
651	,, ,, ..	A	Light ..	Turnbull, A. G. ..	Winniburn North, Coleraine
311	,, Bronze ..	5	,, ..	Leehane, M. D.	Charlton
447	Ben Model ..	A	Draught ..	Adams, H. ..	Yaapeet
943	Berkeley Bantam	A	Pony ..	Crozier, R. ..	South Morang
973	Berwick Victor ..	4	Draught ..	McLeod, A. S. ..	Kyabram
649	Birwood ..	A	Light ..	Riedell, W. A. ..	Tongala
243	Black Diamond ..	6	Draught ..	Neutha, H. ..	Rockbank P.O.
777	,, Imp ..	A	Pony ..	Orton, F. M. ..	Murnungll
648	,, Knight ..	A	Light ..	Lord, G. and W.	Flinnstead P.O., Flynn
84	,, Prince ..	A	Pony ..	Gaudie, Thos. ..	Thoona
445	,, Shepherd ..	A	Draught ..	Simpson Bros. ..	Yambrina P.O.
401	,, Steel ..	A	Thoro'bred	Shepherd, J. K.	Ouyen
602	,, Tom ..	A	Light ..	Potter, A. ..	Naroghid
433	,, Wasp ..	4	Pony ..	Wheelahan, E. ..	Ballan
102	Blair's Choice ..	A	Draught ..	Keam, W. M. R.	Glenlea, via Gerang
528	,, Pride ..	3	,, ..	Palm, T. A. ..	Lorquon
890	Blackwood ..	4	Light ..	Pearce, W. M. ..	Wahgunyah
169	Blue Bolt ..	A	Pony ..	Philip, A. ..	Nerrin Nerrin
876	,, Ribbon ..	A	Draught ..	McGrath, D. ..	Manangatang
934	,, Trout ..	A	Thoro'bred	Scott, H. ..	Lillimur
565	Bob	3	Draught ..	Allen, A. O. ..	Murrayville
317	,, Royal ..	4	,, ..	Robins, W. S. ..	Yatpool
493	Bobbie Dillon ..	4	Light ..	Williams, W. R.	Castlemaine
28	Bobby	A	Pony ..	Officer, Geo. ..	Kilmorey, Woolthorpe
283	Bobniak ..	A	Light ..	Clarke, H. F. ..	Miepoll, via Euroa
380	Bold Action ..	A	Draught ..	Culloden, L. ..	Jung
778	,, Agitation ..	A	,, ..	Chamberlain and Ritchie	Morwell
35	,, Arthur ..	6	,, ..	Galloway, Jas. ..	Majorca
534	,, Briton ..	2	,, ..	Dyke Bros. ..	Gre Gre Village, via St. Arnaud
446	,, Briton ..	A	,, ..	Schulz, C. A., jnr.	Lake Hindmarsh, via Jeparit
256	,, Captain ..	6	,, ..	Werner, C. B. ..	Galah
429	,, Craig ..	4	,, ..	Collins, J. A. ..	Fenton's Creek
712	,, Douglas ..	3	,, ..	Dahlenburg, V. P.	Winiam E.
976	,, Fabric ..	2	,, ..	Hickey, E. ..	Byrneside
402	,, Lad ..	A	Pony ..	Williams, A. C. ..	Corop
264	,, MacGregor ..	A	Draught ..	McNaughton, W.	Walpeup
237	,, Prince ..	A	,, ..	Thomas, F. C., jnr.	Blackheath
628	,, Rowan ..	A	Light ..	Hanrahan, D. ..	Ballan
717	,, Scott ..	4	Draught ..	Bleakley, S. H. ..	Horsham
511	,, Silk ..	3	,, ..	Meyer, J. H. ..	Kaniva
701	Bolwalla (imp.) ..	A	Thoro'bred	Harris and Dunne	Warrnambool
240	Bon Wickliffe ..	A	Light ..	Ford, Jas. ..	Wickliffe
749	Bonite ..	A	,, ..	Gilbert, E. G. ..	Stawell
995	Bonnie II. ..	2	Draught ..	Price, R. ..	Wallacedale South
879	Bonnie Arthur ..	3	,, ..	Arnold, A. ..	Werrigar E.

STALLION REGISTER, 1925–26—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
2	Bonnie Caesar ..	6	Light ..	Beecher, S. R. ..	124 Dundas-street, Fairfield
716	„ Craig ..	3	Draught ..	Jury, C. ..	Mallala, S.A.
503	„ Dundee ..	4	„ ..	Price, J. ..	Mologa
880	„ „ ..	3	Pony ..	Cameron, A. ..	Warracknabeal
451	„ Knight ..	6	Draught ..	Gerrard Bros. ..	Mangalore W.
932	„ Salisbury	5	„ ..	Feldtman, C. H.	Major Plain, via Goorambat
510	„ Threave ..	4	„ ..	Meyer, J. H. ..	Kaniva
956	„ Vanquisher	2	„ ..	Houlihan, T. ..	Yarroweyah
878	„ Viceroy ..	4	„ ..	Bunge, J.,andSons	Sheep Hills
991	Bonny Mac ..	5	„ ..	Brown, J. ..	Stawell
968	Border Prince ..	5	Draught ..	West, N. S. R. ..	Corop
72	Bower Bank ..	A	Light ..	O'Bree, J. ..	Piangil
952	Boy Ribbon ..	4	„ ..	Stayte, E. M. ..	Tongala
675	Bramhope Forester	A	Draught ..	Hill, Mrs. A. E.	Jacka Jacka, Tooan
525	„ Kelm	5	„ ..	Hicks, G. ..	Miram
773	Brassey's Pride ..	A	Pony ..	Millar, A. E. ..	Hopevale
811	Breadwinner ..	A	Light ..	Bridgett, T. ..	Charlton
164	Breastknot ..	A	Draught ..	Moll, W. J. ..	Dimboola
381	Brecknock ..	A	Pony ..	Hentschel, R. ..	Bonnie Doon
954	Brewers March ..	4	Light ..	Nunan, G. ..	Cobram
382	Brigham Again ..	A	Pony ..	Burns, J. ..	Euroa
144	Brigham's Last ..	A	„ ..	Baulch, P. E. ..	Orford, via Port Fairy
798	Bright Green ..	A	Thoro'bred	Biggar, R. ..	Waaia
958	„ Treasure ..	4	Draught ..	Thompson, M. ..	Yalca
887	Brilliant Winsome	3	„ ..	MacLurin, J. McH.	Holbrook, N.S.W.
889	British Signal ..	2	„ ..	Saines, G. ..	Wahgunyah
529	Briton's Bold ..	2	„ ..	Lennecke, F. W.	Detpa, via Jeparit
665	„ Pride ..	A	„ ..	Cameron, A. ..	Balmoral
783	Brown Brilliant ..	5	„ ..	Bartlett, J. T. ..	Barnawartha
564	Bucklyvie's Choice	A	„ ..	Westendorf, W. J.	Dimboola
452	Bundoran ..	A	Light ..	Graham, A. ..	Bacchus Marsh
27	Bungoona ..	A	Thoro'bred	Huon, R. E. ..	Rochester P.O.
772	Bushlark ..	A	Light ..	Penaluna, W. H.	Boolarra
452	Bute Laddie ..	A	Draught ..	Crauford Bros. ..	Linwood, Tatura
133	Button Band ..	A	Light ..	Butler, W. G. ..	Verdon-street, Inglewood
959	Byland's Clifton ..	3	Draught ..	J. Crane ..	Nathalia
26	Calais (imp.) ..	A	Light ..	Officer, G. ..	Kilmorey, Woolsthorpe
25	Calamus ..	A	Thoro'bred	Skinner, T. N. ..	Bordertown, S.A.
179	Canary II. ..	A	Pony ..	Barber, G. T. ..	Korweinguboora
563	Canary's Pride ..	A	„ ..	Nichols, W. ..	Speed
302	Cannonite ..	A	„ ..	Graves, J. C. C.	Mt. Battery, Mansfield
121	Canny ..	A	Thoro'bred	Griffiths, T. A. ..	11 Mile Creek, Glenrowan
797	Captain Douglas ..	6	Draught ..	Rodda, C. S. ..	P.B. Warracknabeal
1007	Carlseberg Prince	3	„ ..	Freyne, E. ..	Kilmore
129	Carman ..	A	Light ..	Lane, W. ..	Lucknow
708	Carmichael ..	A	Draught ..	Pearse, J. A. ..	Greta W.
355	Carmyle ..	4	„ ..	McKinnon, M. ..	Beazley's Bridge
303	Carolyn ..	A	„ ..	Peachey, J. R. ..	Darlingford
209	Carovita ..	A	Pony ..	Merlo, J. ..	Glenmaggie Weir
383	Cascadian ..	A	Draught ..	Cumming, J. ..	Flora Hill, Bendigo

STALLION REGISTER, 1925-26—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
251	Cedric Dale ..	5	Draught ..	Thomas, P. O. H.	Walpeup
62	Cedric's Son ..	A	,, ..	Barber, S. ..	Glanalvon, Birchip
840	Celmar Style ..	A	Light ..	Cochrane, W., and Sons	Doveton-street, Ballarat
562	Chal	A	Thoro'bred	Connor, W. T. ..	Londrigan
702	Cherry Vale ..	A	,,	Wright, Jos. ..	Beech Forest
170	,, Farm Standard ..	A	Draught ..	Clifford, A.	Banyena
51	Cicero ..	A	,, ..	Lloyd, Rd. ..	Kyabram
529	Clair's Pride ..	5	,, ..	Dean, T. J. ..	Landsborough
285	Clan Fingon ..	A	Thoro'bred	Neds Corner Coy.	Mildura
861	,, Campbell ..	3	Draught ..	Newitt, G. ..	Sheep Hills
120	,, Newton ..	A	,, ..	Colson, E. V. ..	Sth. Wangaratta
265	Claredon ..	A	Pony ..	Bennett Bros. ..	Coleraine
83	Clarey ..	A	,, ..	Jones, Jno. ..	Yarroweyah Nth.
196	Claymore ..	A	,, ..	Hanrahan, J. P.	Ballan
434	,, Junior	5	,, ..	,, ,,	,,
891	Claymore's Pride..	4	,, ..	Bromley, E. ..	Tungamah
101	Clyde Boy ..	A	Draught ..	Goldsmith, H.	Corack
304	,, Laddie ..	A	,, ..	Alexander, J. ..	Caniambo
895	Coast Guard ..	3	,, ..	Mitchell & O'Brien	c/o Campbell & Sons, Melbourne
801	Cock Robin ..	A	,, ..	Healey, F. J. ..	Gladstone - street, Orbost
82	Coliban ..	A	,, ..	Todd, Wm. ..	Taradale
266	Colonel Dale ..	A	,, ..	Major, T. F. ..	McMillans P.O.
543	,, Douglas ..	3	,, ..	Jorgenson, A. C.	Katyil
384	,, Garfield ..	A	,, ..	Millard Bros. ..	Deans Marsh P.O.
652	Coma Knight ..	6	Pony ..	Nicholls, C. A. ..	Horsham
896	Comely Footprint	4	Draught ..	Mitchell & O'Brien	c/o Campbell & Sons, Melbourne
119	Commodore Nut ..	A	Pony ..	Manifold and Co.	Purrumbete, Weerite
490	Commonwealth ..	A	Light ..	Mathieson, S. ..	St. Helen's Plains, via Horsham
683	Commonweal ..	A	Draught ..	Holt, W. C. ..	Foster
561	Contractor ..	A	Light ..	Ovens, J. T. ..	Cooma, via Byrneside
147	Conqueror ..	6	Draught ..	McKinnon, M. ..	Berriwillock
897	Coral Premier ..	4	,, ..	Mitchell & O'Brien	c/o Campbell and Sons, Melbourne
807	Corrong Chief ..	3	,, ..	Robins, T. ..	Hopetoun
629	Cosmopolitan II.	A	Light ..	Heath, E. ..	Millbrook
134	Count Bingen ..	A	,, ..	Porker, M. G. ..	Pepper's Plains
560	Craigie Masterstroke	A	Draught ..	Falkiner & Sons Ltd., F. S.	Boonoke North, Widgiewa Siding, N.S.W.
859	Craigieburn Member	4	,, ..	Cameron, A. ..	Box 99, Warracknabeal
542	Craigieright ..	4	,, ..	Jorgenson, A. C.	Katyil
24	Crighton's Tim ..	A	Pony ..	Greaves, S. A. ..	Narre Warren
987	Cronje Wilkes ..	A	Light ..	Mackie, G. B. ..	Camperdown
73	Cross in Hand Charmer	A	Draught ..	Deery, F. ..	Bengworden
403	Culloden ..	A	Light ..	Millard, A. ..	Yaapeet
241	Cymbrel ..	A	,, ..	Hancock, S. ..	Poowong
50	Cyrmo Bach ..	A	Pony ..	McKenzie, C. B.	Yarram

STALLION REGISTER, 1925-26—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
477	Cymro Bar ..	A	Pony ..	Dunn, A. ..	Trawalla
766	Cyndett II. ..	A	„ ..	Marshall, C. T. ..	Vervale P.O.
364	Dalbora's Pride ..	4	Draught ..	Bunworth, W. ..	Watchupga
539	Dalcrombie ..	4	„ ..	Rumbold, J. ..	Laanecoorie
925	Dalkeith ..	4	„ ..	McCluskey, H. ..	Strathmerton
111	Dalmore ..	A	„ ..	Woods, H. ..	Bangerang
153	„ Again ..	5	„ ..	Todd, J. A. ..	Beulah
365	„ Dan ..	2	„ ..	King, W. H. ..	Woomelang
373	„ Pride ..	6	„ ..	McAlpine, W. T. (senr.)	Lascelles
1005	Dalmore's Choice	4	„ ..	Turnbull, A. G.	Winnieburn North, Coleraine
422	„ King ..	5	„ ..	Hodgson, R. ..	Jeffcott North
941	„ Pride	A	„ ..	Heynam, R. G. ..	Patchewollock, via Speed
735	Dancing Bell ..	A	Light ..	Marshall, W. C. ..	Beremboke
61	Dandenong ..	A	Pony ..	Ladlow, R. C. ..	Dooen-road, Horsham
193	Dandy ..	A	„ ..	Purves, P. ..	Green Hills, Rosebud
128	„ ..	A	„ ..	Bell, F. ..	Stony Creek
559	„ Again ..	A	„ ..	Lawler, R. ..	Ouyen
476	„ „ ..	A	„ ..	Marks, J. W., and Sons	Tiega
827	„ Premier ..	A	Draught ..	Zirkler, R. W. ..	Kerang
186	„ Duke ..	A	Pony ..	Kong Meng Bros.	Longwood
647	„ Jim ..	A	„ ..	McDonald, E. ..	Tangambalanga
875	„ Lad ..	A	„ ..	Head, A. C. ..	Seymour
558	„ Lad ..	A	„ ..	Stuckey Bros. ..	Flynn
312	„ Nut ..	A	„ ..	Small, E. S. ..	San Remo
323	„ O. ..	4	„ ..	Forsyth, J. ..	Murrayville
23	Darling's Comet ..	A	Draught ..	Brock Bros. ..	Moe
842	Deck Top ..	A	Light ..	Mackin Bros.	Korong Vale
557	Decorator ..	A	Pony ..	Jennings, F. E. ..	Inglewood
171	Defender ..	A	Draught ..	Ballantyne, J. ..	Cammary Park, Warragul
49	Desert Star ..	A	Pony ..	Mann, A. ..	Walwa
22	Dibdale ..	A	Thoro'bred	Officer, Geo. ..	Kilmorey, Woolsthorpe
684	Dick Alto ..	A	Light ..	Newhound, W. ..	Barnawartha
971	Digger ..	A	Pony ..	Gladstone, Mrs. E. A.	Silver Creek, via Beechworth
556	„ ..	A	Light ..	Dunbar, R. ..	Harston, via Byrneside
338	Dillon Bell ..	A	„ ..	Lewis, G. J. ..	Maldon
185	Dimboola ..	A	Thoro'bred	Rogers, W. ..	Russell's Creek, Warnambool
630	Direct Argot ..	A	Light ..	Matchett, R. ..	Adelaide Hill Stud Farm, Bendigo
190	„ Wilkes ..	A	„ ..	Scown, E. ..	Tutye
851	Director ..	A	„ ..	Lummis, H. T. ..	Murphy's Creek, via Tarnagulla
516	Dixie Wood ..	A	„ ..	Shillito, F. W. ..	Yendon
184	Don Alto ..	A	„ ..	Luckie, G. ..	Springhurst
764	„ Olive ..	A	Pony ..	Cheesley, A. ..	Barnawartha
555	„ Towrie ..	A	Light ..	Dillon, J. ..	Manangatang
221	Donald	A	Pony ..	Attiwill, W. E. ..	Boorkor, Hexham
65	Donald's Best ..	A	Draught ..	Kelly, D. ..	Kunat, via Lake Boga

STALLION REGISTER, 1925–26—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
942	Donnibristle ..	A	Draught ..	Exors. Wilson est.	"Home Station," Milawa
536	Donvin Chimes ..	5	Light ..	Malfahey, J. D.	96 Lewisham-road, Windsor
106	Dooregal Chief	A	Draught ..	Olson, P. R. ..	Jeparit
163	Douglas Chief ..	A	,, ..	Graham, C. A. ..	Box 48, Rupanyup
526	,, Fairbanks	4	,, ..	Dufty, A. B. ..	Lorquon
715	Dreadnot ..	4	,, ..	Cameron, K. ..	Warracknabeal
404	Drum Laddie ..	A	,, ..	Brunt, R. S. ..	Kyabram
34	Drumcross Radiant	A	,, ..	Black, W. M. ..	Coldstream
66	Drumore ..	A	Thoro'bred	McPhee, J. ..	"Inverness," Merino
284	Drysdale ..	A	Draught ..	Crozier, W. ..	South Morang
377	Duddon.. ..	A	Thoro'bred	Dixon, E. W. ..	Cowes, Philip Is.
146	Duke	A	Draught ..	Thornley, E. A. ..	Kangalong; Hawkesdale
601	,, Little Eyes ..	A	,, ..	Bowman, A. E.	Fairy Knowe, Tallangatta
806	Dukemore ..	3	,, ..	Maxwell, J. E. ..	Hopetoun
378	Duke of Winton ..	6	Light ..	Bain, W. C. ..	Lake View, North Winton
748	Dundonald ..	A	Draught ..	Adams, Jno. ..	Box 16, Swan Hill
358	,, ..	4	,, ..	Hepworth, S. ..	P. B. Donald
666	Dundonald's Chief	A	,, ..	Doherty, H. ..	Yundool, St. James, Vic.
600	Dunmore's Pride	6	,, ..	Doherty, J. ..	Bungaree
554	Dunsby's Pride ..	A	,, ..	Baldwin, J. R. ..	Gre Gre Village, via St. Arnaud
631	Dunure Blend ..	A	,, ..	Hehr Bros. ..	Woolert
314	Eastern Star ..	A	,, ..	McLean, L. G. ..	Boolite
222	Eaton Headlight	A	,, ..	Schneider, E. W.	Yulecart
998	Eaton's Pride ..	5	,, ..	Grey, Geo. ..	Branxholme
354	Eclypse ..	4	,, ..	McKinnon, A. ..	Walpeup
898	Elmgrove Brilliant	3	,, ..	Mitchell & O'Brien	c/o Campbell and Sons, Melbourne
100	Emerson ..	A	Thoro'bred	Blair, A. S. ..	Box 30, Watchem
677	Emulator's Pride..	A	Light ..	McArthur, Wm...	Ferndale, Terang P.O.
223	Erigator ..	A	Draught ..	Whinfield, R. ..	Bamawm, Rochester
888	Escomb ..	A	Thoro'bred	Beasley, F. ..	Tocumwal, N.S.W.
924	Ettrick Dale ..	5	Draught ..	Crawford, M. ..	Strathmerton
691	Excel	A	Pony ..	Holt, W. C. ..	Foster
589	Expectation ..	A	Light ..	Bell, A. ..	Gulf Station, Yarra Glen
782	Fabukoff's Heir ..	5	Draught ..	Cheesley, W. ..	Barnawartha
796	Factotum ..	6	,, ..	Grimmer, R. ..	Wickliffe
915	Famous Voyage ..	4	Light ..	McCallum, M. J.	Yarrawonga
899	Farmer's Pride ..	3	Draught ..	Mitchell & O'Brien	c/o Campbell and Sons, Melbourne
916	Farr ..	6	Thoro'bred	O'Dwyer, G. J. ..	Mordialloc
371	Fashion Bow ..	4	Draught ..	McKay, I. ..	Tempy P.O.
208	Fashionable ..	2	,, ..	Tweddle, J. A. ..	Waaia
791	Fashion's Model	A	,, ..	Hamilton, A. B.	Riccarton, Fish Creek
966	Favourite Bold	4	,, ..	Jeffrey, A. C. ..	Tallygaroopna West
900	,, Lad ..	3	,, ..	Mitchell & O'Brien	c/o Campbell and Sons, Melbourne
194	Federation ..	A	Pony ..	Cannon, A. J. ..	Irriwillipe East

STALLION REGISTER, 1925–26—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
763	Federal Duke ..	A	Draught ..	Hendry, Jas. ..	Bridgewater-on-Loddon
151	Fidelo	A	Thoro'bred	Smith, T. H.	Lalbert
678	Finnimore ..	A	,,	Brown, Jas. ..	Natimuk
88	Firebrick ..	A	Light ..	Higgins, P. ..	Cowwarr
860	First Admiral ..	A	Draught ..	Dickens, A.	Wahgunyah
917	,, Grattan ..	A	Light ..	Chisholm, J. T. ..	Cranbourne - road, Dandenong
502	Flash Dale ..	5	Draught ..	Bagnell, T.	Yarrawalla
36	Flashdale ..	6	,, ..	Black, W. M. ..	Coldstream
444	Flash Donald ..	A	Light ..	Jolly, C. A. ..	Woomelang
197	,, Jack ..	A	Draught ..	McIntyre, P. ..	Warracknabeal P.B.
927	Fleuriste ..	A	Thoro'bred	Blackley, D. A. ..	Riddell
646	Foreigner ..	A	Pony ..	Ferrari, C. ..	Devondale
397	Freedom ..	A	Light ..	Montgomery, J.	Milawa
21	Futurist ..	A	Pony ..	Allan, E.	Ondit
420	Gallant Jock ..	6	Draught ..	Hooper, Wm. ..	Bingeluke
792	Gay Bold ..	6	,, ..	Coates, V. ..	Mt. Jeffcott
454	,, Lad ..	A	,, ..	Little, G. ..	Denison
405	,, Gordon ..	A	Pony ..	Dalziel, A. ..	Main-street, Stawell
977	,, Willie ..	4	Draught ..	Starritt Bros. ..	N.W. Mooroopna
123	Gazecka ..	A	Light ..	Burns, W. ..	Ellerslie
376	General Foch ..	A	Draught ..	McTavish, A. ..	Nyah P.O.
599	,, Gordon ..	6	Light ..	Sharp and Taylor	City-road, South Melbourne
692	,, Keith ..	A	Draught ..	McLinden, P. J.	Salisbury West, via Inglewood
785	,, Link ..	4	,, ..	Echardt, J. H.	Beulah
347	,, Scotch ..	A	,, ..	Parle, Jas. ..	Carwarp
632	Gentleman Jack	A	Light ..	Matchett, R. ..	Bendigo
598	Gillies Son ..	A	Draught ..	Boyd Bros. ..	Minhamite
856	Ginger ..	A	Light ..	McLean, D. ..	Chiltern
645	Glen Aire ..	A	,, ..	McKenzie, J. P. ..	Weeaproinah
224	,, Alto ..	6	Pony ..	Frauenfelder, P. F.	Wodonga
930	,, Arthur ..	4	Draught ..	Alexander, J. ..	Caniambo
747	,, ,, ..	A	,, ..	Thomson, H. K.	Springdale, Newlyn
574	,, ,, ..	A	,, ..	Henderson, C. T.	Weatherboard
74	,, Direct ..	6	Light ..	Whitechurch, P.	Box 168, Mildura
886	Glengyle ..	3	Pony ..	Trimble, R. ..	Stud Farm, Rutherglen
357	Glen Isla ..	4	Draught ..	Perry, F. ..	Corack, L. B.
693	Glenmooney ..	A	Light ..	Walsh, L. P. ..	Merbein
707	Glenmore ..	A	,, ..	Murphy, P. ..	Bindi P.O.
242	Glenorchy ..	A	Draught ..	Games, R. S. ..	Yannathan
165	Glyn Trustful ..	A	Pony ..	Roth Bros. ..	Ensay P.O.
541	Gold Mint ..	3	Draught ..	Scott, J. W. ..	Dimboola
992	Golden Simmer ..	4	Pony ..	O'Brien, M. ..	Hamilton
573	Goldenwood ..	A	Light ..	Ovens, J. T. ..	Cooma, via Byrneside
966	Goldie	A	,, ..	Minns, W. J. ..	Melton South
48	Governor Bracey	A	Pony ..	Vause, F. T.	Lyons, via Heywood
885	Graculus ..	5	Thoro'bred	Loveridge, S. ..	Corowa, N.S.W.
794	Grampian Lad ..	6	Draught ..	Richards, A. ..	Gymbowen
644	Grand Huon ..	A	Light ..	Sandwith, J. ..	95 Scott's-parade, Ballarat E.
822	Grattan Bells ..	A	,, ..	Shearwood, T. ..	Dooen North
406	,, Junior ..	A	,, ..	Parish, W. J. ..	Green Park, Horsham

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Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
85	Grey Marvin ..	A	Light ..	Uren, J. S. W. ..	Krowera
47	Guy Todd ..	A	,, ..	Williams, W. ..	St. Arnaud
643	Gwalia Caesar ..	A	Pony ..	McKay, E. ..	Wodonga
455	Gypsy Hero ..	A	Draught ..	Grant, G. (junr.)	Picola, P.B.
698	Hafren Sensation..	A	Pony ..	Reid, Miss B. B.	Blossom Park, Bundoora
824	Halcyon ..	A	Light ..	Maclellan, J. M...	241 Dandenong-rd., Windsor
81	Hamboltonian Direct	A	,,	Wright, R. G. ..	Yarrabert P.O., via Sebastian
225	Hampton Ben ..	A	Draught ..	Seelander, P. ..	Warracknabeal
572	Harmattan ..	A	Thoro'bred	Tobin, C. ..	Eskdale
67	Harry Almont ..	A	Light ..	Pemberton, S. ..	Wedderburn
75	,, Rose ..	A	,, ..	Hunter, A. G. ..	Seymour
46	Harvest King ..	A	Thoro'bred	Nixon, P. C. ..	Orbost
569	Hayston ..	A	,,	Barker, A. E. ..	Moama, N.S.W.
901	Heather Douglas	4	Draught ..	Mitchell & O'Brien	c/o Campbell and Sons, Melbourne
235	Heir Apparent ..	A	Thoro'bred	Defence Dept. ..	Melbourne
713	Hemsdale ..	4	Draught ..	Francis, G. ..	Lower Norton Ck. L.B.
775	Herdsman's Treasure	6	,, ..	Cobbledick, W. J.	Undera
769	Hero	A	Pony ..	Park, T. ..	North Wonthaggi
226	,, ...	A	Draught ..	Hartshorne, H. ..	Picola
20	,, II. ..	A	Pony ..	Greaves Bros. ..	Budgeree, Yannathan
612	Herward Jun. ..	A	Light ..	Haebich, J. A. ..	Bittern
45	Hiawatha of N.Z.	A	Draught ..	Bennett, L. ..	Nullawil
456	High Degree ..	A	,, ..	Schroder Bros. ..	Murrayville
227	,, Honor ..	A	,, ..	Feldtman, C. H.	Major Plains, via Goorambat
509	Highland Chief ..	3	,, ..	Clemens, S. ..	Serpentine
267	,, Cleve ..	A	Light ..	Greatz, W. L. V.	Irymple
508	Highlander ..	4	Draught ..	Clemens, S. ..	Serpentine
457	Hillhead Knight ..	A	,, ..	Krause, R. E. ..	Kinimakatka, via Nhill
568	His Majesty ..	A	,, ..	Frawley, M. ..	Leigh Creek
566	Hivites	A	Thoro'bred	Heywood, F. N.	Toongabbie
458	Honest Wilkes ..	A	Light ..	Adams, H. D. ..	Yielima
613	Honey King ..	A	,, ..	O'Loughlin Bros.	Leongatha
733	Hullabaloo ..	A	,, ..	Bennett, G. ..	Chinkapook
407	Huon's Joy ..	A	Pony ..	Wade, C. S. ..	Nunga, Bronzewing
258	I am Here ..	A	,, ..	Adkins, T. ..	Korumburra
118	Ian McClelland ..	A	Draught ..	Naylor, H. ..	Woolcock Bt., Warracknabeal
581	Ideal Footprint ..	A	,, ..	Falkiner and Sons, F. S.	Widgiewa, N.S.W.
999	,, Toy ..	4	Pony ..	McLeod, M. ..	Condah, Swamp
997	Idris	4	,, ..	Winter-Cook, S...	Murndal, Hamilton
821	Interest ..	A	,, ..	Kennedy, A. ..	Arcadia
918	Invermay ..	6	Draught ..	Hayward, S. G. ..	Nth. Wangaratta
761	Invincible ..	A	,, ..	Adams, H. D. ..	Yielima
820	Ipidi	A	Thoro'bred	Kennedy, A. ..	Arcadia
19	Ironsides ..	A	,,	Hore, Matthew ..	Talgarno, Vic.
214	Jack	A	Draught ..	Fanning, W. ..	Wyuna East

STALLION REGISTER, 1925–26—*continued.*

Cert. No.	Name.	Age.	Class.	Owner.	Address.
		Yrs.			
570	Jack Huon ..	A	Light ..	Coster, G. ..	Mortchup
6	„ Marsh ..	A	Thoro'bred	McDonald, J. F.	Bacchus Marsh
313	„ Tar ..	6	Draught ..	Dufty, J. C. ..	Lorquon West
514	Jacko	3	„ ..	Schnaars, B. F.	Netherby
348	James L Osterley	A	Light ..	Huddleston, A. ..	132 Gheringhap-st., Geelong
894	Jimmie Mac ..	3	Draught ..	McDougall, H. P.	Bundalong
198	Jinghal King ..	A	Thoro'bred	Reid, J. ..	Denicull Creek, via Ararat
694	Jock	A	Draught ..	Wolstenholme, G. T.	Milawa
306	„ McGregor ..	4	„ ..	Reseigh and Flockart	Culgoa
874	John Brigham Last	A	Pony ..	Buckley, G. N. ..	Wickliffe
236	John Douglas ..	A	Draught ..	Dahlenberg, V. P.	Winian E., via Nhill
334	J.N.S.	A	Light ..	Taylor, S. J. ..	Lake Boga
18	Justice	A	Draught ..	Clarke, Sir Rupert	Lancefield Junction
759	Kelm's Best ..	A	„ ..	Bright ..	Mirboo
758	„ Pride ..	A	„ ..	Dugdale, J. ..	Myrniong
430	Kelvin	5	„ ..	McKinnon, D. ..	Beazley's Bridge
931	„ Grove ..	4	„ ..	Baldry, C. ..	Cosgrove
642	Kerrston ..	6	„ ..	Ramsey, N. ..	Newbridge
56	Khamasin ..	A	Light ..	Winter-Cooke, S.	Hamilton
839	Killara's Pride ..	2	Draught ..	Kent, Mrs. S. E.	Sheep Hills
172	Killawney ..	6	„ ..	Neville, E. ..	Marnoo
774	Kilmore ..	A	„ ..	Russell, J. (junr.)	Orbost
286	Kilty ..	A	Light ..	Emonson, H. J.	Suttons, Berriwillock
253	King Albert ..	A	Draught ..	Francis, G. ..	Lower Norton
107	„ „ ..	A	„ ..	McKay, T. ..	Malmsbury
248	„ Almont ..	A	Pony ..	Clarke, J. ..	Silver Hill, Mortlake
108	„ Ballance ..	A	Draught ..	Kennett, J. H. ..	Kaniva
582	„ Bally ..	A	Pony ..	Lee, H. ..	Smeaton-road, Clunes
374	„ Bee ..	A	„ ..	McAlpine, W. T.	Lascelles
1000	„ Cymra ..	2	„ ..	Holmes, E. ..	Wallacedale North, via Condah
268	„ Duncan ..	A	Draught ..	Leydon, P. ..	Cooma P.O.
513	„ Jack ..	4	„ ..	Zanker, A. A. ..	Jeparit
188	„ Jimmy ..	A	„ ..	Henderson, J. ..	Leongatha
583	„ „ II. ..	A	Pony ..	Larcombe, R. H.	Mt. Moriac
393	„ John ..	6	Draught ..	Cail, A. ..	Kamarooka
425	„ Marvin ..	5	Light ..	Walsh, F. H. ..	Melton South
736	„ Osterley A.	A	„ ..	Anderson, G. ..	Newtown, Geelong
349	„ Stanley ..	A	Draught ..	Tyquin, T. ..	Laverton
776	„ Wilks ..	A	Light ..	Brights, J. ..	Stony Creek
756	„ of Clubs ..	A	Draught ..	Beard, J. ..	Terang
974	„ of Movies ..	4	Light ..	Pell, A. ..	Wyuna
173	„ of the Kings	A	Draught ..	Hoken, C. H. ..	Maldon
247	„ of the Shepherds	A	„ ..	Campbell, E. R.	Nypo
650	„ of the Valley	A	„ ..	Murdock, J. ..	Lake Bolac
366	King's First ..	4	„ ..	Jolly, C. A. ..	Woomelang P.O.
757	„ Own ..	A	„ ..	Denham, J. ..	Leongatha
17	„ Treasure ..	A	Thoro'bred	Ritchie, G. ..	Delatite, Mansfield
800	Kingling ..	A	„	Widdicombe, M.	Gymbowen
819	Kingston ..	A	Draught ..	Nicol, R. P. ..	Yarram
459	Kinlock ..	A	„ ..	Hicks, W. ..	Miram

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Cert. No.	Name.	Age.	Class.	Owner.	Address.
69	Kitchener ..	Yrs A	Draught ..	Drysdale and Morrison	Darling
584	Kitchener's Pride	6	,, ...	Younger, H. C. ..	Wattle Hill, Greta

ORCHARD AND GARDEN NOTES.

E. E. Pescott, F.L.S., Pomologist.

The Orchard.

SPRAYING.

The spray pump should now be in thorough working order, so that the various spring sprayings may be carried out with as little interruption as possible. It is always wise to clean out the pump after each spraying, so that it will be ready for the next mixture. Putting a different spray in a pump barrel that has not been washed out very often causes the formation of a sediment, which blocks the nozzle and interrupts the work.

During November it will be necessary to spray for codlin moth, peach aphis, pear slug, and various leaf-eating insects. In addition, black spot of the apple and pear, shot hole, and other fungus diseases must be kept in check. As various sprays are required for all of these troubles, the necessity of always having a clean pump is evident.

At the present time the best spray for peach aphis is nicotine sulphate, and the same spray may also be used for the pear slug. Arsenate of lead is the better spray for this latter insect, but it should not be used when the fruit is approaching the ripening stage; hellebore may also be used for the slug with good effect.

As a preventive against codlin moth, the trees should be kept well sprayed with arsenate of lead. The first spraying should have been given at the time of the falling of the petals; the second spraying, owing to the rapid expansion of the fruit, should be given a fortnight later. After that the grower must use his own judgment as to the necessity for subsequent sprayings. If the moths be at all prevalent, other sprayings will be quickly necessary.

As the woolly aphis is increasing at this time of the year, it will mean a saving of a large number of buds if this insect be sprayed. Nicotine sulphate, pine spray, or lime sulphur may be used with good effect.

Cultivation.

The work of ploughing and harrowing should be completed immediately. All crops for green manure should be now under cover, and if the orchard soil is at all heavy or stiff, the grower should make up his mind to grow a crop next season, in order that this condition may be reduced.

The orchard should be kept free from weeds, not only for the conservation of moisture, but in order to do away with all hiding places of the Rutherglen fly, cutworm moths, &c.

General Work.

Grafted and newly-planted trees should be frequently examined, and given an occasional watering and overhead spraying, in order to encourage their growth, and to prevent loss of moisture from the foliage. It is also advisable to mulch young trees with light grass, or straw mulching not too rich in animal manure.

The disbudding of unnecessary shoots and the pinching back or stopping of growths, to prevent their becoming unduly long, may now be carried out. This work is particularly important on young trees.

Graft ties should be examined, and the ties cut wherever any growth is being made. Where the grafts are likely to make any long growth, they should be well staked and tied.

Citrus trees may be planted out, and, after planting, they should be watered and mulched.

The Vegetable Garden.

Tomato plants should now receive attention every day; laterals will require pinching back; crowded bunches and shoots should be thinned; the plants should be well tied to the stakes, and liberal supplies of water and manure should be given. One or two more plantings of tomato plants may still be made, so that there may be strong, sturdy plants for the production of late fruits. By planting three or four successions of plants, it is possible to have a good supply of fruits from December to June. Pull up and burn all plants showing any signs of disease.

Celery may now be sown for winter crops. French beans should be largely sown. Cucumber, melon, pumpkin, and all seeds of this family may now be sown in the open.

Where these plants are already growing, the longest and strongest runners may be pinched back, to throw the strength into flowering and lateral growths. Watch the plants for mildew, and use sulphur freely wherever present, especially on the young plants.

Peas, lettuce, radish, turnip, cabbage, and sweet corn seeds may be sown this month. Seedlings from former sowings may be planted out, and it would be well to dip the whole plant in water before planting. This greatly assists the young plants while taking hold of the soil in their new location.

Frequent waterings and frequent cultivation will now be necessary; and all weeds must be hoed or hand-weeded out; mulching with stable manure will greatly assist the plants.

A few beds should now be deeply worked, adding a liberal dressing of stable manure. These plots will then be ready for the celery, cabbage, and other seeds planted during this month.

The Flower Garden.

Continue to plant out the various bedding and foliage plants, corms of gladioli, and seed of such tender annuals as Phlox Drummondi, balsam, zinnia, nasturtium, celosia, aster, cosmos and portulaca.

While seeds planted out in the open germinate and grow fairly well, it is advisable during the summer months to plant these in sheltered seed beds, or in a canvas or calico frame. The protection need be on the one side only, preferably the west or north-west; the seedlings are then protected during the hottest part of the day. At the same time the shading should not be sufficient to unduly "draw" them.

The seeds should not be deeply sown, and all waterings should be light. A little water, often, should be the rule for seedlings. Annuals require plenty of room when planted out in the garden. Being quick growers, they are generally gross feeders, and they must have space to develop a good root system. Feeding, too, with liquid manure is helpful when they are reaching the flowering stage.

Dahlias may now be planted out, either from tubers or from young rooted cuttings. These will give good early summer blooms. For autumn and show blooms, the planting should be deferred until the middle of December.

Herbaceous and succulent plants should be staked for protection; included in this section are delphinium, gladiolus, perennial phlox, rudbeckia, &c. These plants will all benefit from liberal mulchings and watering with liquid manure when approaching the blooming period. Spring flowering bulbs, corms, and tubers should now be lifted and stored.

The soil surfaces will now benefit from frequent hoeings and stirrings. Constant waterings will be required if the weather be hot or windy, the cultivation should quickly follow the waterings in order that the moisture may be thoroughly conserved. Mulching with stable manure is also beneficial at this season.

REMINDERS FOR DECEMBER.

LIVE STOCK.

Horses.—All farm horses in constant work at this season should be well fed with last year's chaff or a mixture of old and new, to which a liberal supply of oats has been added. New chaff or hay alone is not recommended, as it has not the sustaining powers of old hay, and is liable to give rise to digestive troubles. Horses require water at frequent intervals; keeping them for a long time without water, and then allowing them to drink to excess is injurious.

An occasional feed of green stuff will be beneficial. In the event of this being unobtainable, give at week-ends a bran mash, to which is added five or six packets of Epsom salts.

Mares which are away from foals for any length of time should have a portion of milk taken from them before foal is allowed to run with them, otherwise serious results may accrue to foal. Good results follow an allowance of chaff and oats to mares and foals running in paddocks, more especially where feed is short.

At this season the Bot Fly is about, and horses should be frequently examined for the eggs of this fly. The neck, forelegs, and jaws are the parts where the eggs are deposited. Either the use of the singeing lamp under affected parts or the application of kerosene will destroy the eggs.

CATTLE.—Provide succulent fodder and plenty of clean water and shade. The silo is the cheapest method of providing succulent fodder, silage costs less than 10s. per ton to grow and save. Mow and make hay of as much grass as possible. This will keep indefinitely so long as it is protected from the weather. Mice will not work in it. Limewash the cowbails, it helps to keep down flies. Provide "lick" in trough, consisting of salt 20 lb., bone meal 20 lb., 20 lb. slaked lime, and sulphate of iron ½ lb. Look out for milk fever. Read up method of treatment in *Journal of Agriculture* for November, 1922. Have cows' milk weighed, and tested for butter-fat. Rear heifer calves from cows giving satisfactory results. Continue giving milk at blood heat to calves. Be careful to keep utensils clean, or diarrhœa will result. Do not give too much milk at a time for the same reason. Give half a cup of limewater in the milk to each calf. Let them have a good grass run or lucerne, or ½ lb. crushed oats each per day in trough. Dehorn all dairy calves, except those required for stud or show purposes.

PIGS.—*Sows.*—Supply those farrowing with plenty of short bedding in well-ventilated sties. Those with litters old enough may be turned into grass run. *All* pigs should be given a plentiful supply of clean water. Read Bulletin No. 16. Pig raising and fattening with present price of pollard and bacon should be profitable.

SHEEP.—Shearing should now be over except in the case of a few late lambs in the wetter parts of the State. All faulty-mouthed ewes should be disposed of as fats; if not fat they should, if possible, be fattened for sale. Inferior-fleeced ewes should also be sold. Those in favoured areas should replace culls with young sheep of good quality. Ewe lambs intended to be held for future breeding should be classed, and only the best retained.

December is the joining month; lambs will then drop in May and June. Leave the rams with the ewes for seven weeks in case any ewe should come into season a second time. Join 2 per cent. of two-tooth, four-tooth, six-tooth, and eight-tooth rams, or 3 per cent. of older rams with the flock; with fine-woolled Merino rams 3 per cent. of two-tooths is advisable. Rams should be in good condition. Pare their feet and clean wool and burrs from around eyes and pizzles before joining.

Breeding ewes should be of one breed or cross, and should be culled, so that the wool of the progeny will be as even in quality as possible. This precaution would also ensure an even dropping of lambs. Merinos and fine-woolled ewes come into season first; half-bred and strong-woolled crosses later; all sheep with a preponderance of British blood are even later still. It is useless to join rams with ewes until their proper time for coming into season. Rams may be active, but ewes will not conceive until in season.

Preparation should be made for dipping. Mix dip thoroughly, and in the manner indicated in directions. Leave sheep in yards overnight before dipping. If possible, dipping should not be done during hot weather.

POULTRY.—Add a little pearmeal to morning mash and give less bran. Feed equal parts wheat and heavy oats at night. Supply plenty of green food—at this time, lettuce is invaluable. Avoid salt meat of any description. Keep ample supplies of sand, ashes, &c., in pens, and moisten same. This will enable the

birds to keep themselves cool and clean. Top off geese, ducks, and cockerels for the Christmas markets. Hens will do better this month by having free range. Remove all male birds from flocks, as infertile eggs will keep longer and command a higher price.

CULTIVATION.

FARM.—Cut hay in late districts. Cut oats and barley in early places. Finish planting potatoes. Put in late maize for fodder, also millet and imphee. Plough fire-breaks where required. Get stackyard and stages ready for hay.

ORCHARD.—Keep the surface loose and free. Suppress weeds. Spray as often as necessary for codlin moth and pear slug. Mulch and spray young trees and grafts with water in the early morning during hot weather.

VEGETABLE GARDEN.—Keep the surface hoed, and allow the plants plenty of moisture. Stake, pinch out, manure, and water tomatoes. Pinch back long runners of pumpkin and melon family. Sow autumn and winter varieties of cabbage and cauliflower. Plant out seedlings in cool weather. Sow French beans. Cease cutting asparagus beds, and top-dress with manure.

FLOWER GARDEN.—Plant out dahlias and gladioli for autumn blooming. Lift and store spring flowering bulbs. Stake, tie, and train growing plants. Sow zinnias and asters. Layer carnations, camelias, daphnes, &c. Water well and keep the surface loose. Keep rose beds fairly dry.

BEE-KEEPING.

December is the month for the main honey flow from yellow box and red gum. Swarming is practically over for the season except, perhaps, in late districts. Where there has been more swarming than the owner of the bees desired, and the total yield of honey is the object aimed at rather than increase in the number of colonies, the weaker stocks may be united at the commencement of the honey flow, as the highest return is secured by having a given number of bees in the fewest possible number of hives; that is to say, 50,000 worker bees in one hive will store a far greater amount of honey than the same number in two hives with 25,000 bees in each. Such a large worker-force requires three bodies of full-depth frames, otherwise the best results cannot be obtained, because nectar being as thin as water when brought in by the bees, only a little is put into each cell to hasten evaporation. When, therefore, sufficient empty combs are not available to the bees, part of the worker-force will be idle.

Each colony should have at least three sets of Langstroth size combs, and when these are not available the time of the red gum honey flow is suitable for getting new combs drawn out from full sheets of foundation. Comb foundation is expensive, but in the end combs built from starters are more expensive still, because so much drone comb is built when starters only are given, that one of the principal advantages of the frame-hive system is lost.

All frames should be wired, four horizontal wires being most in favour with beekeepers; the wires should be well embedded into the foundation so that it may not come away from them. Between the bottom edge of the sheet of foundation and the bottom bar of the frame there should be a space of at least ¼-inch, to allow for the expansion of the sheet by the heat of the hive.

The best combs are obtained when the foundation is drawn out by the bees in the super immediately over the brood nest without an intervening excluder.

Combs should be capped at least two-thirds before being extracted, so that the honey will be of good density. When hives are run three stories high, as indicated above, there is no necessity to extract all the honey at one time; one set of combs can be extracted, and the empty combs returned to the hive, and when they are partly filled again the others can be taken. In this way the bees are not upset so much as when all the combs are wet and sticky after extracting, and the risk of leaving the hive destitute of stores is avoided should the honey flow suddenly cease.

A High-Grade, Home-Grown
Supplemental Feed
for any kind of Stock

SOY OR SOJA BEANS

SPLENDID FODDER FOR STOCK
EXCELLENT FOR HAY
OF GREAT VALUE FOR ITS
FERTILIZING PROPERTIES

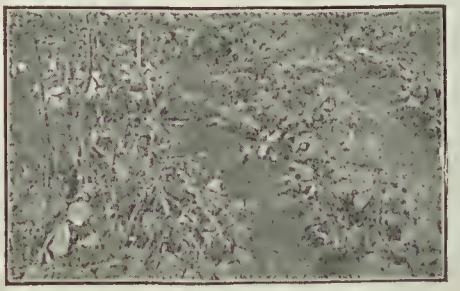
The Soy Bean plant is as high in feeding value as Lucerne, and may be used in the form of hay, pasture, silage, or soilage, or as a protein concentrate. Soy Beans grown alone for seed or hay solve the problem of preparation of Winter wheat ground, since they leave the soil in excellent condition for wheat with no preparation whatever. For hay or fertilizer, sow 60 to 90 lb. per acre; or, if sown between rows of maize, 60 lb. per acre. **1/-** lb.; **50/-** bushel (60 lb.).

COW PEAS

Excellent Summer Fodder

Great Soil Improver

Drought Resistant



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Makes Good Land more Productive

Enormously productive both of vine and peas; of exceptional value for feeding Hogs and Cattle. The Cow Pea is a wonderful gatherer of Nitrogen, and as a means of adding humus to the soil is easily the superior of any nitrogen gathering legume. Sow 1 to 2 bushels per acre broadcast, or in drills 3 ft. apart, ½ bushel per acre. **8d.** lb.; **70/-** per cwt.

FIELD LUPINS

A Remarkable Crop Raiser

Sow from November to March at the rate of 1¼ bushels per acre for mulching purposes. If sown early in January, and ploughed in in May, Oats or other crops can then be sown. By following this method a satisfactory crop is assured without the loss of a season. One good crop ploughed in will give two satisfactory crops in return. **9d.** lb.; **40/-** bushel (60 lb.).

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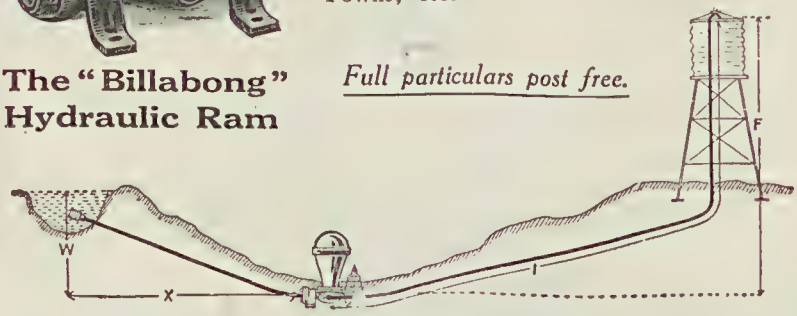

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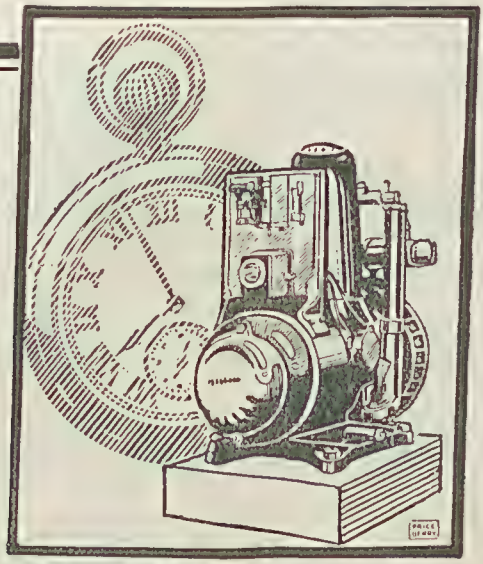

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YOU'LL marvel at the compactness of DELCO LIGHT. Here is a plant where every useless, makeshift part has been eliminated—where awkward mechanisms that do things in a roundabout way have been so simplified that freedom from trouble is assured.

There are no belts, pulleys, chain drives, gears, elaborate cooling systems, and other troublesome paraphernalia in the DELCO LIGHT. Nothing to rob the engine of power that should be turned into electricity. Scarcely anything to get out of order.

So that the compactness of DELCO LIGHT means something more than mere saving of space—it guarantees unusual efficiency, economy, freedom from trouble, and such utter simplicity that a child can operate and attend to it without danger.

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(Opp. Danks') ——————— *Phone Cent. 8888—4 lines*

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IN
SHEEP DIP

The excellence of "VALLO" Powder Sheep Dip is endorsed by well-known Sheep-breeders. Read what one of the principal users writes:—

BOONOKE NORTH STATION,
Widgiewa Siding, N.S.W.,
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Messrs. A. Victor Leggo & Co.,
497-503 Collins Street,
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Dear Sirs,

We wish to say that we have used your Dip, for both spraying and dipping, with great success. We find "VALLO" is easy to mix (which is an important point), and we consider it equal to, if not better than, any other brands of dip we have used, and certainly much cheaper.

Yours faithfully,
For F. S. FALKINER & SONS Ltd.,
(Signed) OTWAY R. FALKINER,
Manager.

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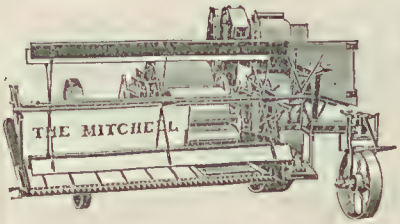

Musk and Thistles

Are Easily Handled by Mitchell Headers.

MITCHELL HEADERS are the only ones that deal successfully with all weeds—musk particularly. Headers are built to take off crop in any condition—don't buy the kind that will not. GET A MITCHELL.

The well-known Wimmera farmer, Mr. J. H. Reichelt, of Lorquon, says :—
"As for down crop, thistles, or other weeds, your machine will deal with anything."

Mr. R. J. Beggs, Kellalac, says :—
"What made me buy a 'MITCHELL' was because my crop was infested with musk. This is where the 'MITCHELL' stands out compared with other machines. I have had great experience with musk in crops, and the way the 'MITCHELL' handled it and did her work was a pleasant surprise to me, and I gave her a thorough test in it."

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20 Quart	24/-	3 Gallon	21/6
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A complete cooler consists of cooler, strainer, vat and tap, galvanized brackets, unions and hose.

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Perfect skimming, easy running, simple and strong construction.
Sizes from 10 to 115 gallon. Cash or easy terms.

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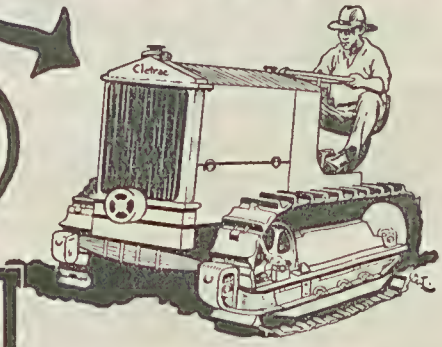

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ANALYSIS—98% Calcium Oxide.

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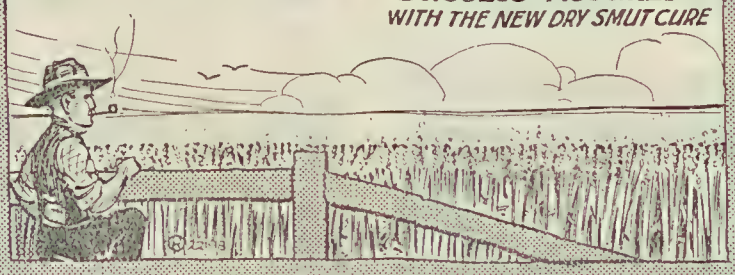

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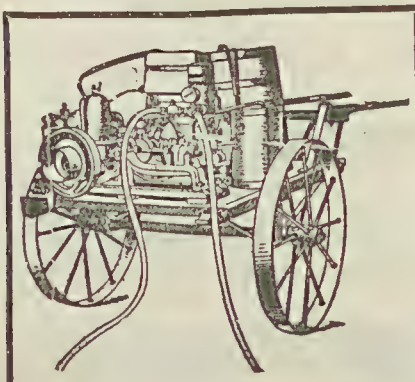

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DEPARTMENT OF AGRICULTURE, VICTORIA

Red Poll Dairy Herd

The Department has now completed the orders for calves that were booked ahead of calving when the advertisement was withdrawn; consequently the booking of orders for bull calves from the forthcoming calvings has now been resumed.

BULL CALVES are sold for delivery at a month old at prices based approximately on the actual milk and butter fat record of the dam at the rate of 1s. per lb. of butter ***fat*** yielded. Thus a calf from a cow with a 400 lb. butter fat record is sold for 20 guineas, one from a 300 lb. butter fat cow for 15 guineas, and so on. Bull Calves *ex* heifers on their first calf are sold for a set price of 10 guineas.

(For Record of Yields of dams see Red Poll Herd Book.)

SIRES IN USE:

VICTORIA VOLCANO (322 A.)

Sire: Nicotine (69 A.A.) by Acton Dewstone (imp.) 9524 (4 A.A.).
Dam: Tonga (253 A.) by Honingham Archbishop (imp.) 9702 (48 A.A.).

Tonga's butter fat yields for 6 successive lactation periods are as follow:—1916, 341 lb.; 1917, 398 lb.; 1918, 419 lb.; 1919, 479 lb.; 1920, 428 lb.; 1921, 562 lb.

BELLIGERENT (Imported) 11096 (8 A.A.)

Dam's Record (1st milking) 7144 lb. milk.

Dam's Dam's	,,	14533 lb. milk	...	4 years	average	12871 lb. milk.
Sire's Dam's	,,	10370 ,,	...	7 ,,	,,	9354 ,,
Sire's D. Dam's	,,	9510 ,,	...	12 ,,	,,	8033 ,,
G. Sire's D. Dam's	,,	10215 ,,	...	7 ,,	,,	9386 ,,
G.G. Sire's D. Dam's	,,	12565 ,,	...	10 ,,	,,	8853 ,,
G.G.G. Sire's D. Dam's	,,	10088 ,,	...	2 ,,	,,	9754 ,,

BIT O' 'BACCA (Vol. 3)

Sire: Nicotine (69 A.A.) by Acton Dewstone (imp.) 9524 (4 A.A.).
Dam: Nictitana (311 B.) by Nicotine (69 A.A.).

Nictitana's butter fat records for 6 successive lactation periods are as follow:—1918, 450 lb.; 1919, 396 lb.; 1920, 393 lb.; 1921, 465 lb.; 1922, 524 lb.; 1923, 536 lb.

Inspection of the Herd is Invited.

Visitors will be met at the Station on notifying the Manager, State Research Farm, Werribee.

Application for purchase to

Dr. S. S. CAMERON, DIRECTOR OF AGRICULTURE, MELBOURNE.

DEPARTMENT OF AGRICULTURE

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The Stores have a capacity of **743,980 cubic feet insulated,** and are capable of holding **372,000 boxes of butter,** or **248,000 cases of fruit, or 335,000 carcasses of lamb and mutton.**

Electric motor power totals 900 H.P.

Produce can be placed on conveyors at any point and mechanically carried to any chamber in the building, or conveyed from the chambers direct into the ship's hold.

The Railway Department Goods Sheds are adjacent to and connected with the Cool Stores by direct lines; delay and exposure of produce through shunting in the Spencer-street yards, or cartage, are thus avoided. The Stores are situated in close proximity to the Victoria Dock, where vessels drawing up to 30 feet of water can be berthed; excellent facilities for the efficient and economical treatment and shipment of frozen and perishable products are provided.

Expert Officers are connected with every Branch, so that any one requiring information regarding the production, preparation, and shipment of produce can rely upon being promptly supplied with up-to-date information upon all matters.

DEPARTMENT OF AGRICULTURE

GOVERNMENT COOL STORES

VICTORIA DOCK

Facilities are provided for producers and smaller exporters of the various kinds of produce, so that direct shipments on their own account may be undertaken. The Government ownership and conduct of Cool Stores places producers in an independent position, and, in addition, preserves an open channel for the carrying on of the export trade in perishable products.

The Department of Agriculture will receive, handle, freeze, store, and ship **Butter, Cheese, Eggs, Fruit, Meat, Poultry, Rabbits and Hares, &c.,** for producers and exporters.

Produce to the value of over **£30,000,000** has been treated at the **Government Cool Stores.**

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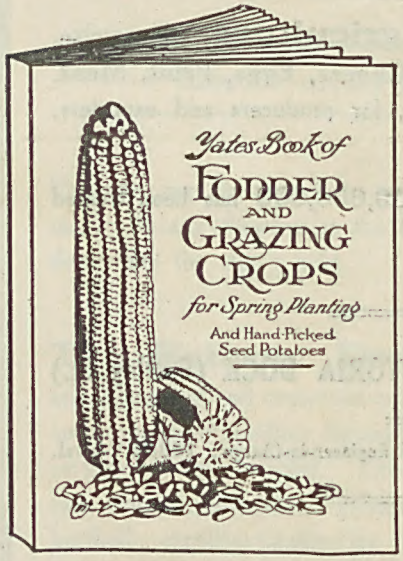

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FRIESIANS FOR SALE

(1) BULL "VICTORIA TOPNOTE" *ex* DOMINION HYACINTH (374)

Dropped 29th August, 1923

Sire: **Victoria Songboy (359)** by Dominion Domino Dutch Boy (73).

Sire of Dam: **Oak de Kol 2nd Homestead Fobes** (imp. to N.Z. from America) (341 N.Z.F.H.B.).

Dominion Hyacinth's Record for 273 days under Government Herd Test—
11,512 lb. Milk, 479 lb. Butter Fat. Price, 40 guineas f.o.r. Werribee.

For Full Lactation Period—
13,898 lb. Milk, 589 lb. Butter Fat.

(2) Bull Victoria Patch Lad *ex* Victoria Oakdale Lassie (996)

Dropped 24th September, 1923

Sire: **Victoria Jo Patch (345)** by Longbeach Big Patch (515 N.Z.F.H.B.), *ex* Dominion Madrigal (371).

Sire of Dam: **Dominion Oakdale (342)** by Oak de Kol 2nd Homestead Fobes.

Her Dam, Dominion Proud Lassie's Record for 273 days under Government Herd Test—
11,336 lb. Milk, 3·42 Test, 387 lb. Butter Fat.
Price, 32 guineas f.o.r. Werribee.

For Full Lactation Period—
12,216 lb. Milk, 3·51 Test, 428 lb. Butter Fat.

(3) Bull Victoria Woodpatch *ex* Dominion Woodnymph (988)

Dropped November, 1923

Sire: **Victoria Jo Patch (345)** by Longbeach Big Patch (515 N.Z.F.H.B.), *ex* Dominion Madrigal (371).

Sire of Dam: **Woodcrest Jo** (imp. to N.Z. from America) (334 N.Z.F.H.B.).

Dam's Record for 273 days under Government Herd Test—
10,610 lb. Milk, 3·17 Test, 336 lb. Butter Fat.

For Full Lactation Period—
13,240 lb. Milk, 3·31 Test, 439 lb. Butter Fat.

The record of the dam—DOMINION MADRIGAL—of the sires "Victoria Songboy" and "Victoria Jo Patch" for 273 days under Government Herd Test is 11,373 lb. Milk, 3·93 Test, 448 lb. Butter Fat; and for Full Lactation Period 13,485 lb. Milk, 4·17 Test, 563 lb. Butter Fat. "DOMINION MADRIGAL" is a full sister to "DOMINION QUEEN MERCEDES," third cow of all breeds under Government Herd Test 1923, and Winner "Weekly Times" Butter Competition, Melbourne Royal Show 1923, and Champion Melbourne Royal Show 1923.

Price, 32 guineas f.o.r. Werribee.

(4) Bull Victoria Bellringer *ex* Victoria Dutchbelle (990)

Dropped October, 1924

Sire: **Victoria High Patch (537)** by Victoria Jo Patch (345).

Sire of Dam: **Dominion Domino Dutch Boy (73)** by Longbeach Primrose League (698 N.Z.).

Dam's Record for 273 days under Government Herd Test—
8,768 lb. Milk, 314 lb. Butter Fat, 358 lb. Commercial Butter.
Price, 22 guineas f.o.r. Werribee.

(5) Bull Victoria Bridegroom *ex* Victoria Wedding Bell (999)

Dropped 13th September, 1924

Sire: **Burnbank Inka Segia Pietje (402)** by Alderley Segis Beets (imp.) (187).

Sire of Dam: **Victoria Milkman Jo (344)** by Woodcrest Jo (imp.) (344 N.Z.).

Dam's Record for 273 days under Government Herd Test: First Lactation Period—
6,838 lb. Milk, 3·50 Test, 239 lb. Butter Fat.
Price, 15 guineas f.o.r. Werribee.

G. Dam, DOMINION BELLE CORONA'S record for 273 days under Government Test—10,799 lb. Milk, 382 lb. Butter Fat, 436 lb. Commerical Butter. For Full Lactation Period—14,027 lb. Milk, 513 lb. Butter Fat, 585 lb. Commercial Butter.

Inspection of above Bull Calves at the State Research Farm, Werribee, is invited.

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